

LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY<sup>1/</sup>

Core samples of the Green River Formation from Bureau of Mines-Atomic Energy Commission Colorado Corehole No. 1 drilled in 1965 and 1966 in NW1/4NE1/4SE1/4 (2331 ft N of S line and 1284 ft W of E line), sec 13, T 1 N, R 98 W, Rio Blanco County, Colorado.

Surface elevation: 6003 feet  
Described section: 770.0-3133.2 feet  
Mahogany marker (?): 1070.6 feet

Donnell-Fuchs Branch  
U. S. Geological Survey  
Bldg. 25, Denver Federal Center  
Denver, Colorado

From	To	Description
770.0	771.8	Marlstone and some oil shale: buff to some medium brownish gray (10YR 8/2-7/2, some 6/2-5/2 lower part). Very faint distorted bedding to distinct streaks and stringers. Irregular to some fairly regular thick parting; slightly irregular fracture. Sample of buff marlstone from 770.1 feet: X-ray - calcite, quartz, dolomite; some feldspar, analcite, illite.
771.8	773.1	Oil shale: medium brownish gray to buff (10YR 5/2-7/2, rare 8/2 & 4/2). Fairly distinct slightly distorted to smooth streaks, bands, and laminae. Irregular thick parting; irregular fracture. A resinous black fossil leaf (?) on parting surface at 772.8 feet.
773.1	773.8	Oil shale: medium to dark brownish gray and rare tan to buff (10YR 4/2-3/2, some 5/2, rare 6/3-8/2). Faint to rare distinct smooth laminae and streaked bedding; rare fine to small loop structures. Rare high angle natural fractures with very fine calcite crusts. Very rare very fine pyritic streaks. Sample of medium to dark brownish gray oil shale from 773.6 feet: X-ray - dolomite, quartz, calcite, analcite; some feldspar, illite.
773.8	777.3	Oil shale: medium and rare dark brownish gray to buff (10YR 4/2-8/2, rare 3/2 upper part). Distinct to some faint, smooth to slightly distorted streaks and laminae. Slightly irregular thick to medium parting; irregular to slightly conchoidal fracture. Some small irregular folds at 775.5-775.7 feet. Rare fine gray pyritic streaks in lower part.
777.3	778.3	Oil shale: medium brownish gray to buff (10YR & 2.5Y 5/2-8/2, rare 4/2). Distinct slightly distorted streaks, stringers, and rare bands. Slightly irregular to irregular, thick to medium parting; irregular to slightly conchoidal fracture. Very rare very fine gray pyritic streaks.

<sup>1/</sup> By L. G. Trudell

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
778.3	780.0	Oil shale: medium brownish gray to buff (10YR & 2.5Y 5/2-7/2, rare 4/2 & 8/2). Distinct slightly distorted streaks, stringers, and laminae; some fine to small loop structures and displacements. Irregular to slightly irregular, thick to medium parting; irregular to conchoidal fracture. Rare fine pyritic streaks. A nearly vertical natural fracture with very fine calcite crusts and rare pyrite extends through interval.
780.0	781.0	Oil shale: medium and rare dark brownish gray to buff (10YR & 2.5Y 4/2-7/2, some 8/2, rare 3/2). Distinct smooth to slightly distorted streaks and laminae; common fine loop structures and displacements. Irregular to fairly regular thick parting; slightly conchoidal to irregular fracture. Rare fine pyrite streaks.
781.0	782.0	Oil shale: medium brownish gray to buff (10YR & 2.5Y 5/2-8/2, some 4/2). Distinct slightly distorted to smooth streaks and laminae; some fine loop structures and displacements. Irregular to some regular thick parting; slightly conchoidal to irregular fracture. Very rare fine pyrite streaks.
782.0	783.0	Oil shale: medium brownish gray to tan and buff (10YR 4/2-6/3 & 7/2 and 2.5Y 5/2-7/2). Distinct fairly smooth streaks and laminae; common very fine loop structures and displacements. Irregular to slightly irregular, thick to medium parting; conchoidal to slightly irregular fracture. A natural high angle fracture with very rare very fine pyrite in middle part.
783.0	785.0	Oil shale: medium brownish gray to buff (10YR 5/2-7/2). Moderately distinct slightly distorted streaks and rare laminae; common fine displacements. Irregular parting and fracture. Common natural diagonal fractures with rare very fine pyrite.
785.0	787.0	Marlstone and oil shale: buff to rare medium brownish gray (10YR 7/2-6/2, some 8/2, rare 5/2). Moderately distinct to faint, slightly distorted to smooth streaks; common fine displacements. Irregular to some fairly regular thick parting; slightly conchoidal to irregular fracture. Some natural (?) high angle fractures. Some irregular mixed up core pieces; true length doubtful.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
787.0	791.5	Missing
791.5	797.0	Oil shale: medium brownish gray to buff (10YR & 2.5Y 5/2-7/2). Faint fairly smooth to distorted streaks, stringers, and rare laminae; common fine displacements. Irregular parting and fracture. Some high to low angle natural (?) fractures. Some irregular mixed up core pieces; true length doubtful.
797.0	798.7	Oil shale: medium brownish gray to buff (10YR 5/2-7/2, rare 8/2). Faint to moderately distinct distorted streaks and stringers. Very irregular parting and fracture. Common medium to high angle natural fractures with very fine pyrite. A thin vitreous black brittle organic streak near base. Some irregular mixed up core pieces; true length doubtful.
798.7	800.0	Oil shale and marlstone: light and rare medium brownish gray to buff (10YR 6/2-7/2, rare 5/2). Very faint distorted streaks and stringers. Irregular parting and fracture. Some natural (?) diagonal fractures. Rare small blebs and fine streaks of very fine grained pyrite. Rare very fine vitreous black organic streaks in middle part.
800.0	802.0	Siltstone and marlstone: gray-buff and buff to light brownish gray (10YR 7/1 & 7/2-6/1 & 6/2). Massive to very faint distorted streaks and stringers. Irregular thick parting; slightly conchoidal to irregular fracture. Very rare fine pyrite streaks. Very rare very fine black flecks. <div style="margin-left: 40px;"> Sample of massive gray-buff siltstone from 801.7 feet:  X-ray - albite, quartz, dolomite, analcite, pyrite. </div>
802.0	803.3	Marlstone: buff and some gray-buff to very rare medium brownish gray (10YR 7/2-6/2, some 7/1 & 8/2, rare 5/2). Faint distorted to fairly smooth streaks and rare laminae; common fine displacements. Irregular thick parting; slightly irregular to conchoidal fracture.
803.3	806.8	Missing.

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Laramie Petroleum Research Center, Laramie, Wyoming

April 6, 1967

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
806.8	809.4	Marlstone: buff and gray-buff to rare medium brownish gray (10YR 8/2 & 8/1-6/2, rare 5/2). Faint to very faint distorted streaks and laminae; very common fine displacements and some loop structures. Irregular thick parting; irregular to conchoidal fracture. Some natural (?) diagonal fractures. A 0.1 foot massive buff to brownish gray band with some fine irregular cavities and drusy crystals at 807.8 feet. Some badly broken up and mixed up core pieces in lower part; true length doubtful. Sample of massive band with <u>fine cavities</u> and drusy crystals from 807.8 feet: [ X-ray - dolomite; trace quartz, feldspar, analcite.
809.4	812.6	Siltstone: light brownish gray to gray-buff (10YR 6/1-8/1, some 9/1). Fairly distinct to very faint, distorted to contorted stringers and streaks. Irregular thick to medium parting; irregular to conchoidal fracture. Some very fine carbonaceous flecks. Buff marlstone with intricately contorted bedding at 810.7-811.2 feet. A 1/2- x 3/4-inch very fine grained pyrite nodule at 811.3 feet. Some irregular mixed up core pieces; true length doubtful.
812.6	816.0	Missing.
816.0	822.8	Mudstone and siltstone: gray-buff and buff to light and very rare medium brownish gray (10YR 8/1 & 8/2-6/1, some 9/1, rare 5/1-5/2). Very faint contorted bedding to moderately distinct stringers. Irregular parting and fracture. Rare to fairly common fine black carbonaceous flecks. Some irregular mixed up core pieces in middle part; true length doubtful.
822.8	829.0	Siltstone: gray-buff to light brownish gray (10YR 7/1-6/1, rare 8/1; commonly almost neutral gray). Faint contorted to distorted stringers and some massive. Very irregular to slightly irregular parting and fracture. Rare very fine carbonaceous flecks. Some parts badly broken up and mixed up; true length doubtful.
829.0	834.8	Missing
834.8	837.0	Siltstone: gray-buff to light brownish gray (10YR 8/1-6/1 & 6/2, rare 9/1). Faint distorted to fairly smooth stringers and laminae. Irregular to fairly regular thick parting; irregular to fairly smooth fracture. Some very fine carbonaceous specks in lower part.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
837.0	839.0	Siltstone and marlstone: gray-buff and buff to rare light brownish gray (10YR 8/1 & 8/2-7/1 & 7/2, rare 6/1-6/2). Very faint contorted to distorted streaks. Irregular parting and fracture. Some very fine carbonaceous specks in siltstone.
839.0	844.1	Siltstone: gray-buff (10YR 8/1-7/1, rare 9/1). Very faint to rare moderately distinct, distorted to contorted streaks and stringers. Very irregular parting and fracture. Some very fine carbonaceous specks. Rare small pyrite blebs. Some very irregular mixed up core pieces; true length doubtful.
844.1	847.5	Missing.
847.5	848.6	Siltstone and some very fine sandstone: gray-buff to light and rare medium brownish gray (10YR 8/1-6/1, rare 5/1 upper part), slightly calcareous. Distinct distorted stringers to very faint bedding. Irregular to slightly irregular thick parting; slightly irregular fracture. Some very fine carbonaceous specks and streaks. Some fine marlstone and oil-shale shreds in middle part.
848.6	850.1	Mudstone: gray-buff and buff (10YR 7/1 & 7/2-8/1 & 8/2), slightly calcareous. Faint fairly smooth to distorted streaked bedding; common fine displacements and some irregular loop structures. Irregular thick parting; irregular to conchoidal fracture. Very rare very fine carbonaceous streaks.
850.1	852.4	Sandstone: gray-buff to buff-white (10YR 8/1-9/1; almost neutral), fine grained. Massive; common fine mudstone and marlstone shreds and stringers. Irregular thick parting; irregular to fairly regular fracture. Common fine carbonaceous flecks in upper part.
852.4	854.3	Siltstone, mudstone and some fine sandstone: gray buff to some buff (10YR 7/1-8/1, some 7/2-8/2). Faint distorted streaks and stringers. Irregular parting and fracture. Common very fine carbonaceous flecks in sandy parts.
854.3	856.3	Missing.
856.3	859.0	Siltstone: gray-buff (10YR 7/1; almost neutral). Very faint distorted bedding. Irregular parting and fracture. Some irregular mixed up core pieces; true length doubtful.
859.0	861.0	Sandstone, siltstone, and mudstone: buff-white to light and rare medium brownish gray (10YR 9/1-6/2, rare 5/2). Distinct slightly distorted laminae and thin bands. Slightly irregular thick parting; slightly irregular fracture. Some fine pyrite streaks at 860.5 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMinas-AEC Colorado Corehole No. 1--Continued

From	To	Description
861.0	864.0	Siltstone, mudstone, and rare fine sandstone: gray-buff to some light brownish gray and rare buff white (10YR 7/1-8/1, some 6/1, rare 9/1; commonly almost neutral). Faint and rare distinct distorted streaks and stringers to some massive. Irregular parting and fracture. Rare very fine carbonaceous flecks.
864.0	865.4	Missing
865.4	868.0	Sandstone and siltstone: gray-buff to rare light brownish gray and buff-white (10YR 7/1-8/1, rare 6/1 & 9/1; commonly almost neutral). Faint and rare moderately distinct, distorted to fairly smooth streaks and stringers; some massive. Irregular parting and fracture. Fairly common very fine carbonaceous flecks.
868.0	870.7	Sandstone: buff-white and white to very light gray (10YR 9/1 & N 9.0-8.0), fine to medium grained. Massive; a 2-inch band of very faintly bedded siltstone at 869.0 feet; rare siltstone laminae and stringers in other parts. Slightly irregular thick parting (some diagonal); slightly irregular fracture. Some fine carbonaceous flecks and streaks. <div style="margin-left: 40px;"> <div style="display: inline-block; vertical-align: middle; font-size: 3em; line-height: 1;">[</div> <div style="display: inline-block; vertical-align: middle;"> Sample of medium grained sandstone from  870.0 feet:  X-ray - albite, quartz, dolomite, analcite,  pyrite. </div> </div>
870.7	873.3	Mudstone, siltstone, and very fine sandstone: light brownish gray to buff-white (10YR 6/1-9/1). Distinct distorted to fairly smooth streaks, laminae, and thin bands. Irregular thick parting; slightly irregular to irregular and conchoidal fracture. Common fine carbonaceous streaks in upper part. Some irregular mixed up core pieces; true length doubtful.
873.3	880.8	Sandstone: light gray to buff-white (N 7.0-8.0 & 10YR 9/1), fine to medium grained. Massive; some fine laminae and streaks to thin bands of light brownish gray siltstone. Irregular thick parting; slightly irregular fracture. Some very fine carbonaceous specks and streaks concentrated in zones up to 2 inches thick.
880.8	883.0	Sandstone and siltstone: very light gray to light brownish gray (N 8.0 to 10YR 6/1). Massive to moderately distinct distorted stringers. Irregular parting and fracture. Common very fine carbonaceous specks and streaks. Some irregular mixed up core pieces; true length doubtful.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
883.0	893.0	Siltstone and very fine sandstone: gray-buff to buff-white (10YR 7/1-9/1, some almost neutral). Very faint distorted bedding with some faint stringers. Irregular parting and fracture. Common very fine carbonaceous specks in some parts.
893.0	896.0	Siltstone and some fine to medium grained sandstone: gray-buff and some buff-white to light brownish gray (10YR 8/1-6/1, some 9/1). Faint distorted to fairly smooth streaked bedding with some thick massive sandstone bands. Irregular to slightly irregular thick parting; slightly irregular fracture. Some very fine pyrite in sandstone.
896.0	899.4	Siltstone: gray-buff to light brownish gray and rare buff-white (10YR 7/1-6/1, some 8/1, rare 9/1). Very faint slightly distorted streaked bedding and some faint distorted to contorted stringers, laminae, and bands. Irregular to slightly irregular thick parting; slightly irregular to some very irregular fracture. Some very fine marlstone and oil-shale streaks and laminae. Some irregular mixed up core pieces; true length doubtful.
899.4	901.0	Missing.
901.0	903.0	Siltstone, mudstone, and marlstone: gray-buff and buff to rare light brownish gray (10YR 7/1 & 7/2-8/1 & 8/2, rare 6/1-6/2). Very faint distorted streaks to fairly smooth laminae with common fine loop structures and displacements. Irregular to fairly smooth, thick to medium parting; irregular to slightly conchoidal fracture.
903.0	904.7	Mudstone, siltstone, and sandstone: light brownish gray to buff-white (10YR 6/1-9/1). Faint to moderately distinct, distorted to contorted streaks and stringers. Irregular parting and fracture. Some very fine carbonaceous specks in sandy parts. Some irregular to badly broken up and mixed up core pieces; true length doubtful.
904.7	906.8	Mudstone, siltstone, and sandstone: as above but smoothly laminated and banded with fairly regular parting. Some very fine marlstone laminae in lower part.
906.8	910.0	Siltstone and rare sandstone: light brownish gray to gray-buff (10YR 6/1-7/1, rare 8/1). Faint to moderately distinct, distorted to contorted streaks and stringers. Irregular parting and fracture. Some natural high angle fractures in lower part. Some parts badly broken up and mixed up; true length doubtful.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
910.0	912.6	Missing.
912.6	915.5	Siltstone and some fine sandstone: light to some medium brownish gray and gray-buff to buff-white (10YR 6/1-7/1, some 5/1 & 8/1-9/1). Faint slightly distorted streaks in upper part to distinct smooth to irregular laminae and thin bands in lower part. Irregular to fairly regular, thick to medium parting; fairly smooth to irregular fracture. Some very fine carbonaceous specks and streaks.
915.5	923.8	Siltstone, mudstone, and some sandstone: light brownish gray to buff-white (10YR 6/1-9/1; some almost neutral). Massive to faintly bedded siltstone and mudstone with thick zones of interbedded siltstone and sandstone with graded bedding. Irregular to fairly regular, thick to medium parting; very irregular to slightly irregular and conchoidal fracture. Some thick bands to fine laminae and stringers of buff marlstone in upper part. Some broken up and mixed up core; true length doubtful.
923.8	924.0	Missing.
924.0	932.1	Siltstone and mudstone: gray-buff and rare light brownish gray (10YR 7/1, some 8/1, rare 6/1; commonly almost neutral), slightly calcareous. Very faint to faint, contorted to fairly smooth streaked bedding. Irregular parting and fracture. Thick bands of buff-white fine to medium grained sandstone in lower foot. Some irregular mixed up core pieces; true length doubtful.
932.1	933.7	Mudstone and siltstone: gray-buff and some buff-white to light brownish gray (10YR 7/1-6/1, some 8/1-9/1 upper part), slightly calcareous. Faint distorted to fairly smooth stringers, bands, and laminae. Irregular parting and fracture. Some fine marlstone and oil-shale stringers and laminae. Some irregular mixed up core pieces; true length doubtful. <div style="margin-left: 40px;">Sample of almost neutral gray siltstone from 933.6 feet:  X-ray - quartz, analcite, dolomite, feldspar, pyrite.</div>
933.7	936.7	Oil shale: light to medium and rare dark brownish gray, some buff in upper and middle parts (2.5Y & 10YR 6/2-4/2, some 7/2-8/2, rare 3/2). Distinct to some faint contorted laminae; common displacements and small overturned folds. Very irregular to some fairly regular, thick to medium parting; irregular to slightly conchoidal fracture. Some thin gray-buff mudstone stringers near top.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		<p>[ Sample of light to medium brownish gray contorted shale from 936.2 feet: X-ray - dolomite, quartz, calcite, analcite, some feldspar.</p>
936.7	943.7	Missing.
943.7	944.1	Oil shale: buff to dark brownish gray (10YR 8/2-3/2, rare 2/2); rare resinous luster. Distinct contorted and folded to fairly smooth laminae. Irregular parting; slightly conchoidal fracture.
944.1	945.1	Marlstone and lean oil shale: buff to medium brownish gray (10YR 7/2-5/2, rare 4/2). Faint distorted to contorted streaked bedding. Irregular to fairly regular thick parting; slightly conchoidal to irregular fracture.
945.1	946.2	Oil shale: dark to light brownish gray and rare buff (10YR & 7.5YR 3/2-6/2, rare 7/2). Distinct to faint contorted streaks and stringers. Irregular thick parting; irregular to slightly conchoidal fracture. Rare small to fine pyritic brownish gray crystalline blebs and streaks.
946.2	947.4	Marlstone and oil shale: buff to medium brownish gray (10YR 7/2-4/2). Distinct to faint, distorted to contorted streaks and stringers. Fairly regular to irregular thick parting; irregular fracture.
947.4	950.5	<p>Siltstone and mudstone: medium to light brownish gray (10YR &amp; 7.5YR 5/1-6/1 &amp; 6/2), calcareous. Very faint distorted to contorted bedding with common irregular marlstone and oil-shale stringers and shreds. Irregular parting and fracture. Very rare very fine disseminated pyrite to small massive pyrite nodules.</p> <p>[ Sample of mudstone with rare fine marlstone shreds from 949.3 feet: X-ray - quartz, analcite, feldspar, dolomite, calcite.</p>
950.5	952.0	Mudstone, marlstone, and oil shale: buff and gray-buff to medium brownish gray (10YR 8/2 & 8/1-5/2, rare 4/2). Very faintly bedded mudstone with common thin to fine marlstone and oil-shale stringers and shreds in upper part; marlstone and oil shale with fairly distinct distorted streaked bedding in lower part. Irregular parting and fracture. Some broken up and mixed up core in upper part; true length doubtful.

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Laramie Petroleum Research Center, Laramie, Wyoming

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Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
952.0	955.2	Mudstone and marlstone: buff to some light brownish gray (10YR 8/2-7/2 & 7/1, some 6/2-6/1). Very faint distorted streaked bedding. Irregular parting and fracture. Very rare fine oil-shale streaks and shreds.
955.2	958.0	Mudstone to medium grained sandstone and some marlstone: gray-buff to buff (10YR 8/1-7/1 & 7/2). Massive to contorted streaked bedding. Irregular parting and fracture. Some very fine carbonaceous specks. Marlstone with very contorted truncated laminae in lower 0.4 foot. Some parts badly broken up and mixed up; true length doubtful.
958.0	962.3	Missing.
962.3	963.0	Marlstone: buff to light and rare medium brownish gray (10YR 7/2-6/2, rare 5/2). Faint distorted to contorted laminae, streaks, and stringers. Irregular parting and fracture. Some very irregular silty to sandy stringers.
963.0	972.0	Siltstone: gray-buff (10YR 7/1-8/1, rare 6/1; some almost neutral), calcareous. Very faint contorted to fairly smooth streaked bedding and some massive to mottled. Irregular parting and fracture. Some marlstone stringers and shreds. Rare fine carbonaceous specks.
972.0	975.0	Mudstone, marlstone, and some sandstone: gray-buff and buff (10YR 7/1 & 7/2-8/1 & 8/2). Faint distorted streaked bedding to massive and mottled. Very irregular parting and fracture. Some parts very badly broken up and mixed up; true length doubtful.
975.0	984.7	Missing.
984.7	985.9	Oil shale: medium and some dark brownish gray to buff (10YR 4/2-7/2, some 3/2, rare 8/2). Distinct fairly smooth to rare contorted laminae and streaks. Irregular to some very regular thick parting; slightly irregular to slightly conchoidal fracture. Very rare fine pyrite streaks.
		[ Sample of distinctly laminated oil shale from 985.1 feet: X-ray - dolomite, quartz, calcite, analcite, some feldspar.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
985.9	986.8	Mudstone (tuff?) and oil shale: buff-white to very light gray-buff slightly calcareous mudstone (10YR 9/2-8/2 & 8/1) and medium to dark brownish gray oil shale (10YR 5/2-2/2). Faintly streaked to massive mudstone; a 0.1-foot band of dark oil shale at 906.3 feet; common fine oil-shale streaks and stringers from 906.4 to 906.6 feet. Irregular to rare regular, thick to medium parting; slightly irregular and conchoidal fracture. Sharp slightly irregular wavy contacts with oil shale above and below.
		Sample of mudstone from 986.0 feet: X-ray - dolomite, quartz, feldspar, calcite.
986.8	987.5	Oil shale: medium to dark brownish gray and brown, rare tan to buff (10YR 5/2 & 5/3-3/2, rare 6/3-7/2 & 2/2). Moderately distinct fairly smooth to distorted and displaced laminae and streaks. Irregular parting and fracture. Rare fine gray pyritic streaks and blebs. A very thin irregular tan to buff, earthy to granular tuff stringer at 986.9 feet.
987.5	989.5	Break in core sequence; true length missing unknown.
A-groove		
989.5	992.5	Marlstone and oil shale: buff to medium brownish gray and brown (10YR 8/2-5/2 & 5/3, rare 4/2). Fairly distinct smooth laminae; common fine loop structures and displacements. Regular to slightly irregular, thick to medium parting; irregular to slightly conchoidal fracture. Some fine pyrite streaks and blebs.
992.5	994.5	Marlstone: buff to some tan and very rare medium brown (10YR 8/2-7/2, some 6/2-6/3, rare 5/2-5/3 lower part). Faint to rare moderately distinct smooth laminae. Regular to slightly irregular thick parting; fairly smooth to slightly irregular and conchoidal fracture.
		Sample of marlstone from 992.6 feet: X-ray - dolomite, quartz, calcite, feldspar, analcite.
994.5	995.4	Mudstone and oil shale: buff calcareous mudstone (10YR 7/2-8/2) and medium to dark brownish gray and brown oil shale (10YR 5/2 & 5/3-3/2). Massive mudstone with thin oil-shale stringers and shreds in upper and lower parts; very faintly bedded to laminated oil shale in middle. Irregular thick parting; slightly irregular and conchoidal fracture. Common very fine disseminated crystals in oil shale.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		<p>Sample of oil shale with disseminated crystals from 994.8 feet:  X-ray - calcite, dolomite, quartz, analcite, feldspar.</p>
995.4	996.4	Marlstone and oil shale: buff to medium brown and some dark brownish gray (10YR 7/2-4/2 & 4/3, some 3/2). Fairly distinct smooth laminae and streaks. Slightly irregular thick parting; slightly conchoidal fracture. Common massive buff mudstone laminae and bands in lower 0.2 foot.
996.4	997.1	Oil shale: medium to dark brownish gray and brown, some tan to buff in lower part (10YR & 7.5YR 5/2 & 5/3-3/2, some 6/3-7/2, rare 2/2). Faint to fairly distinct, very distorted to fairly smooth streaks, stringers, and laminae. Irregular parting and fracture. Some very fine dark pyritic blebs and stringers.
997.1	998.1	Marlstone and oil shale: buff to tan marlstone in upper part (10YR 8/2-6/3), medium to dark brownish gray and brown oil shale in lower 0.2 foot (10YR 5/2 & 5/3-3/2). Faint slightly distorted to smooth streaks and laminae in marlstone; fairly distinct contorted streaks and laminae in oil shale stringer at base. Irregular parting and fracture.
998.1	1000.2	<p>Marlstone, mudstone, and some oil shale: buff to some tan and medium brown (10YR 8/2 &amp; 8/1-7/2, some 6/3-5/3). Faint to some distinct distorted streaks and stringers; a 0.2-foot zone of smoothly laminated oil shale at 999.1 feet. Very irregular to slightly irregular thick parting; irregular to fairly smooth fracture. Rare fine crystalline calcite streaks in mudstone.</p> <p>Sample of mudstone from 1000.0 feet:  X-ray - dolomite, quartz, calcite; some feldspar, analcite.</p>
1000.2	1001.5	Oil shale and marlstone: medium brown to buff and rare dark brownish gray (10YR 5/3-7/2, some 4/3-4/2, rare 3/2 & 8/2). Faint to distinct, distorted to contorted laminae and streaks. Irregular parting and fracture. Rare fine dark pyritic blebs and streaks.
1001.5	1003.3	Mudstone, marlstone, and rare oil shale: buff to rare medium brownish gray and brown (10YR 8/2-7/2, rare 6/2-5/2 & 5/3). Very faintly bedded to massive mudstone with fine shreds and irregular fine to thick stringers of marlstone and oil shale. Irregular parting and fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1003.3	1005.7	Marlstone and oil shale: buff to some medium brownish gray and brown (10YR 7/2-6/2, some 5/2-5/3 & 8/2, rare 4/2-4/3). Distinct to faint smooth laminae; common fine loop structures and displacements. Smooth to some irregular, thick to thin parting; conchoidal to some very irregular fracture. Occasional thin dense gray fine grained crystalline bands and stringers. Rare fine dark gray pyritic streaks in lower part. Some irregular mixed up core pieces in upper part; true length doubtful. <div style="margin-left: 40px;">Sample of thin dense gray crystalline band from 1005.0 feet:  X-ray - quartz, dolomite, feldspar.</div>
1005.7	1010.0	Missing.
1010.0	1014.0	Marlstone: buff to some light brownish gray (10YR & 2.5Y 8/2-7/2, some 6/2-6/1). Moderately distinct to very faint, smooth to distorted laminae and streaks; contorted and intricately crenulated zones at 1011.7-1012.0 and 1013.4-1013.9 feet. Smooth to some irregular thick parting; slightly conchoidal to irregular fracture. Occasional 1/2- to 2-inch bands of gray tuff (like 1005.0 feet). Common very fine dark gray to black pyritic streaks, stringers, and fracture fillings in contorted zones; rare in other parts.
1014.0	1016.0	Tuff (?) and marlstone: gray-buff to light gray tuff (2.5Y 7/1 to N 7.0) and buff to some light brownish gray marlstone (2.5Y & 10YR 8/2-7/2, some 6/2-6/1). Fine laminae to 3-inch bands of massive silty-textured tuff alternating with fine to thick zones of smoothly laminated marlstone; common fine loop structures in marlstone. Smooth to some irregular thick parting; smooth to slightly irregular and conchoidal fracture. A smooth diagonal fracture with very fine grained pyrite crusts near base.
1016.0	1018.0	Marlstone: buff to some light brownish gray (2.5Y 8/2-7/2, some 6/2). Faint smooth laminae; some very fine loop structure. Very smooth thick parting; slightly conchoidal to irregular fracture. Some very fine gray to black pyritic streaks. A 0.2-foot light gray to gray-buff tuff with some slight brownish stains at 1016.6 feet. <div style="margin-left: 40px;">Sample of marlstone from 1016.5 feet:  X-ray - dolomite, quartz, sanidine.</div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1018.0	1018.9	Marlstone and oil shale: buff to some medium brownish gray (2.5Y & 10YR 8/2-6/2, some 5/2). Faint to moderately distinct; smooth to rare slightly distorted laminae and streaks; some fine loop structures. Smooth to slightly irregular thick parting; conchoidal to irregular fracture. Some fine gray to black pyritic streaks and diagonal fracture fillings. Rare very thin gray-buff tuff laminae.
Bottom A-groove		
1018.9	1019.9	Oil shale: light to some dark brownish gray (10YR & 2.5Y 6/2-4/2, some 3/2). Fairly distinct smooth laminae; some fine loop structures and displacements. Smooth to some irregular thick parting; slightly conchoidal fracture. Rare fine gray tuff streaks and laminae (some pyritic); a very thin irregular pinched out brown tuff stringer at 1019.7 feet. Massive 1/2- to 3/4-inch buff marlstone bands and some fine laminae at 1019.4-1019.5 and 1019.8-1019.9 feet.
1019.9	1021.4	Oil shale: medium to dark brownish gray (10YR 5/2-3/2). Faint smooth to slightly distorted streaked bedding and some laminae. Fairly smooth to some irregular thick parting; conchoidal to irregular fracture. Occasional very thin to fine dense brownish gray to gray stringers, streaks, and laminae. Rare thin to fine massive buff marlstone bands in upper part.
		Sample of medium to dark brownish gray oil shale from 1020.4 feet:
		X-ray - dolomite, quartz, feldspar, analcite.
1021.4	1023.7	Oil shale: medium to light brownish gray and some buff in upper part (10Y 4/2-6/2, some 7/2) and tan to medium brown and rare brownish gray in lower part (10YR 6/3-5/3, rare 5/2-4/2 & 4/3). Moderately distinct to very faint, smooth to slightly irregular and wavy laminae down to 1022.9 feet; finely brecciated to contorted streaks and stringers in lower part. Fairly smooth to irregular thick parting and slightly conchoidal to irregular fracture in upper part; very irregular parting and fracture in lower part. A 1-inch finely contorted buff zone with common fine dense gray to white crystalline blebs at 1021.9 feet. Rare very fine irregular fracture with chalky white to brown crystalline fillings from 1022.5 to 1022.9 feet. Some fine dense white to gray crystalline blebs and rare very fine dark brown crystals in breccia in lower part.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of brecciated shale with fine crystalline blebs from 1023.2 feet: X-ray - quartz, dolomite; some analcite, feldspar.
1023.7	1025.0	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, some 5/2). Faint very distorted to fairly smooth streaked bedding and some laminae. Very irregular to slightly irregular, thick to medium parting; irregular fracture. Some very irregular thin to fine dense gray stringers. A very irregular vertical fracture with common very fine pyrite in upper 0.3 foot.
1025.0	1027.2	Oil shale: medium to very dark brownish gray and rare brown to tan (10YR 4/2-2/2, rare 5/2 & 5/3-6/3); rare satiny luster. Faint to rare distinct, slightly distorted to smooth laminae; rare fine loop structures and displacements. Smooth to slightly irregular, thick to some thin parting; fairly smooth to irregular and conchoidal fracture. Rare thin brown to gray tuff stringers and lenses. Rare tight diagonal fractures with very fine pyrite in upper part.
		Sample of dark brownish gray oil shale from 1026.6 feet: X-ray - quartz, dolomite, analcite, feldspar, illite, pyrite, ferroan.
1027.2	1028.2	Oil shale: medium brown to some tan and rare dark brownish gray (10YR 5/3-4/3 & 4/2, some 6/3, rare 3/2). Faint to moderately distinct, distorted and commonly displaced to fairly smooth laminae. Slightly irregular to irregular parting and fracture. Common very fine irregular fractures with pyrite and buff earthy to crystalline fillings in upper part.
1028.2	1029.6	Oil shale: medium and some dark brownish gray and brown to tan and buff (10YR 4/2-6/2 & 6/3, some 3/2 & 7/2, rare 8/2 lower part). Distinct smooth to slightly distorted laminae. Smooth to some irregular thick parting; conchoidal to irregular fracture. Rare fine irregular fractures with dark gray pyritic fillings in upper part. Rare fine to thin dense gray to gray-buff streaks and stringers in lower part. A 1-1/2-inch dark to medium brown, dense to silty-textured tuff at 1029.0 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of brown tuff from 1029.0 feet: X-ray - analcite, quartz.
1029.6	1030.6	Oil shale: medium brownish gray to buff (10YR 5/2-7/2, some 4/2, rare 8/2). Distinct to some faint smooth laminae and streaks with occasional fine loop structures and displacements in upper and lower parts; a thick massive brownish gray silty-textured tuff with contorted marlstone stringers and shreds at 1030.0-1030.3 feet. Slightly irregular thick parting; slightly conchoidal to irregular fracture. Rare fine dense buff to gray crystalline streaks and lenses in upper part.
		Sample of tuff from 1030.2 feet: X-ray - quartz, feldspar, dolomite, ferroan, analcite, pyrite.
1030.6	1031.6	Oil shale: buff and tan to some dark brownish gray (10YR 7/2 & 6/3-4/2, some 3/2). Distinct to some faint, smooth to rare slightly distorted laminae. Smooth to slightly irregular, thick to medium parting; irregular fracture. Some fine to small dense gray to gray-buff crystalline lenses, streaks, and laminae. A smooth diagonal fracture with chalky white coatings and some dark brown resinous crusts in upper part.
		Sample of shale with small gray crystalline lenses from 1031.2 feet: X-ray - analcite, quartz, dolomite, ferroan; some feldspar, pyrite.
1031.6	1032.2	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, rare 2/2 & 5/2). Moderately distinct to very faint, smooth to slightly distorted laminae and streaks. Slightly irregular thick parting; slightly conchoidal to irregular fracture. Some fine dense tan to buff dolomite (?) laminae and streaks. A thin irregular brownish gray dense to fine sandy-textured tuff stringer at top; a thin irregular pinched out tuff stringer and rare small tan lenses near base.
1032.2	1035.0	Oil shale: buff to some dark brownish gray (10YR 7/2-4/2, some 3/2). Distinct to some faint, smooth to distorted laminae and streaks. Fairly smooth to some very irregular, thick to medium parting; slightly irregular to very irregular fracture. Fairly common fine to thin dense tan and buff to brownish gray and gray streaks, lenses, stringers, and bands. A very irregular 1/2- to 1-1/4-inch dark brown fine sandy textured tuff at 1034.7 feet. Rare short tight vertical fractures.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of dense tan dolomite (?) band from 1033.1 feet: X-ray - dolomite; some quartz, feldspar, analcite,
1035.0	1036.0	Oil shale: medium to dark and some light brownish gray (10YR 4/2-3/2, some 5/2-6/2, rare 2/2). Faint to some moderately distinct smooth laminae and streaks. Slightly irregular to fairly smooth, thick to thin parting; irregular to fairly regular fracture. Rare fine dense gray to brown and buff streaks and lenses.
1036.0	1037.4	Oil shale: buff to medium brown and rare dark brownish gray (10YR 7/2-4/3, rare 3/2). Distinct very distorted streaks and stringers to very smooth laminae; some fine loop structures and displacements. Irregular to very smooth thick parting; irregular to slightly conchoidal fracture. Very common irregular dense gray stringers and some tight irregular vertical fractures in upper part. Some very irregular brown to brownish black, dense to silty-textured stringers with tarry impregnations in middle part. Rare fine gray to tan and buff streaks and lenses in lower part.
		Sample of distinctly laminated oil shale from 1037.0 feet: X-ray - dolomite, quartz, analcite, feldspar.
1037.4	1039.1	Tuff (?) and some marlstone and oil shale: medium brown and brownish gray tuff. (10YR 5/3 & 5/2-4/3 & 4/2) and some buff to rare dark brownish gray marlstone and oil shale (10YR 8/2-5/2, rare 4/2-3/2). Dense massive dolomitic tuff with common very irregular thin to fine marlstone and oil-shale stringers, inclusions, and shreds; intricately contorted marlstone in upper 0.3 foot; marlstone and oil shale with distorted to smooth laminae and streaks in lower 0.4 foot. Irregular thick parting; irregular to conchoidal fracture. An irregular 1-inch brownish gray silty-textured, tar-stained tuff at base.
		Sample of dense massive tuff (?) from 1037.8 feet: X-ray - quartz, feldspar, analcite, dolomite, ferroan.
1039.1	1040.0	Missing.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1040.0	1041.0	Oil shale: medium to some dark brownish gray (10YR 5/2-4/2, some 3/2). Moderately distinct to faint, slightly distorted to smooth laminae. Slightly irregular to regular thick parting; slightly irregular fracture. Some fine to small, brownish gray to gray dense crystalline blebs and streaks.
1041.0	1041.9	Oil shale: medium to dark and rare light brownish gray (10YR 4/2-2/2, rare 5/2-6/2). Faint smooth laminae. Regular thick to medium parting; slightly irregular fracture. Some small irregular dark brownish gray to brown fine granular tuff lenses near top. Very rare very fine pyrite streaks in lower part.
1041.9	1042.5	Tuff and oil shale: medium brownish gray and brown tuff (7.5YR & 10YR 4/2 & 4/3-5/2 & 5/3) and medium brownish gray to rare black oil shale (10YR 4/2-2/2, rare 1/2). Massive silty-textured tuff with rare thin contorted oil-shale stringers from 1042.0 to 1042.4 feet; oil shale with faint smooth to wavy laminae in upper and lower parts; a very irregular thin tuff stringer near base. Very irregular parting and fracture. A thin tan zone with common fine dense gray stringers and blebs at top. Sample of tuff from 1042.3 feet:
1042.5	1043.9	X-ray - quartz, analcite, albite, some dolomite? Oil shale: dark to medium and rare light brownish gray (10YR 3/2-5/2, some 2/2 & rare 6/2 upper part). Moderately distinct to very faint smooth laminae; some fine loop structures and displacements. Slightly irregular to regular, thin to thick parting; irregular to fairly smooth fracture. Some fine tuff laminae and lenses in upper part.
1043.9	1044.9	Oil shale: dark to light brownish gray (10YR 3/2-6/2, some 2/2). Faint smooth laminae in upper and lower parts; moderately distinct distorted and commonly displaced laminae in middle part. Fairly smooth to some irregular thick parting; slightly conchoidal to irregular fracture. Some very irregular fine pyritic crystalline streaks and stringers in middle part. A very irregular pinched out silty to fine granular bitumen-impregnated tuff at 1044.6 feet. Sample of distorted shale with crystalline streaks and stringers from 1044.3 feet: X-ray - quartz, pyrite, dolomite, feldspar, analcite.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1044.9	1045.3	Tuff: tan to medium brownish gray (10YR 6/3-5/2). Massive, very fine silty texture, with some very fine light specks; rare thin irregular fine granular stringers. Irregular thick parting; slightly irregular to conchoidal fracture. Slightly wavy contact with oil shale above; smooth contact at base.
1045.3	1046.5	[ Sample of massive tan tuff from 1045.1 feet: X-ray - albite; some quartz, ferroan, dolomite? Oil shale: medium to dark and rare light brownish gray (10YR 5/2-3/2, rare 6/2 & 2/2). Faint to moderately distinct, slightly distorted to smooth laminae and streaks; some fine loop structures and displacements. Slightly irregular thick parting; irregular fracture. Rare fine gray to brownish gray and buff dense crystalline streaks and lenses. Some thin irregular dark brown <u>bitumen-impregnated</u> stringers and blebs at 1045.6 feet. A natural high angle fracture with slight blue-gray chalky coatings in lower 0.4 foot.
1046.5	1049.5	Oil shale: medium to dark brownish gray and rare black (10YR 4/2-2/2, some 5/2, rare 1/2); rare satiny luster. Moderately distinct to faint smooth laminae and some very faint streaked bedding. Regular to some irregular, thick to medium parting; irregular to slightly conchoidal fracture. Rare fine crystalline streaks and lenses. Core sequence may be incorrect in lower half.
1049.5	1050.6	Oil shale: very dark to some medium brownish gray and rare black (10YR 2/2-3/2, some 4/2, rare 1/2); some satiny luster. Very faint to faint, smooth to some distorted and displaced laminae and streaked bedding. Slightly irregular to very smooth, thick to medium parting; irregular to rare slight hackly fracture. Some very fine irregular crystalline stringers in distorted shale at 1049.8-1050.1 feet. Rare fine dense dark gray to brownish gray streaks and laminae in lower part.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMinas-AEC Colorado Corehole No. 1--Continued

From	To	Description
1050.6	1051.2	Oil shale and tuff: very dark and rare medium brownish gray to black satiny shale (10YR 2/2-1/2, some 3/2, rare 4/2) and medium to light brownish gray and dark brown tuffs (10YR 5/1-6/2 & 7.5YR 3/3). Very faint distorted to smooth laminae in oil shale; irregular 1-inch brownish gray silty-textured tuffs at 1050.6 and 1050.8 feet; a 1-1/4-inch pinched dark brown fine sandy-textured tuff near base. Irregular to slightly wavy, thick to medium parting; slightly irregular to some coarse hackly fracture. Some fine oil-shale shreds and small inclusions in upper tuff. Common very fine buff earthy spots in middle tuff. Some fine crystalline streaks, stringers, and laminae in oil shale. Sample of brownish gray tuff with fine earthy spots from 1050.8 feet: X-ray - quartz, feldspar, analcite, dolomite, ferroan, illite.
1051.2	1052.0	Oil shale: black to dark brownish gray and rare dark brown (10YR 1/2-2/2, some 3/2 & rare 3/3 lower part); common satiny to rare resinous luster. Very faint very smooth laminae and streaked bedding; some fine loop structures and displacements. Regular to slightly irregular thick parting; slightly irregular and rare slight hackly fracture. A very thin brown dense to granular crystalline stringer near top. Sample of very dark satiny shale from 1051.5 feet: X-ray - dolomite, quartz, analcite, feldspar, pyrite, illite.
1052.0	1053.0	Oil shale: dark to medium brownish gray (10YR & 7.5YR 3/2-4/2, some 2/2 upper part, rare 5/2 lower part). Faint smooth to slightly distorted streaked bedding and some laminae. Slightly irregular to some wavy thick parting; irregular to some conchoidal fracture. Rare thin dense brown to tan stringers. A 1-inch tan to brown, silty to earthy tuff at 1052.8 feet.
1053.0	1053.8	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, rare 2/2 & 5/2). Very faint very distorted to smooth streaked bedding and rare laminae. Irregular thick parting; irregular to conchoidal fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1053.8	1055.4	Oil shale: medium to light brownish gray and tan, rare dark brownish gray and buff (10YR 4/2-6/2 & 6/3, rare 3/2-2/2 & 7/2). Faint and rare distinct slightly distorted streaks and stringers in upper part; moderately distinct very distorted laminae in lower part. Irregular parting and fracture. Common small white to brownish gray crystalline patches and stringers at 1054.6-1055.0 feet. A slight unconformity at 1054.5 feet. Sample of very distorted shale with crystalline patches from 1054.9 feet: X-ray - unidentified peaks, analcite, dolomite, feldspar, quartz.
1055.4	1056.8	Tuff (?) and some oil shale: medium to light brownish gray tuff (10YR 5/2-6/2), and tan to dark brownish gray oil shale (10YR 6/3-3/2). Very faint irregular bedding in tuff with some thick contorted oil-shale stringers and fine shreds. Irregular parting and fracture. Unconformable contact with oil shale below. Sample of tuff from 1056.6 feet: X-ray - quartz, analcite, dolomite, feldspar.
1056.8	1061.0	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, some 2/2, rare 5/2). Faint slightly distorted to smooth laminae and streaks. Fairly smooth to some irregular thick parting; irregular fracture. Rare to fairly common fine tan to brownish gray dense lenses, streaks, and laminae. Sample of dense brownish gray dolomite (?) lamina from 1060.0 feet: X-ray - quartz, dolomite; some analcite, feldspar.
1061.0	1062.0	Oil shale: medium to dark brownish gray (10YR 5/2-3/2, rare 2/2). Faint smooth laminae and streaks; common fine loop structures and displacements in lower part. Slightly irregular to very irregular thick parting; irregular to conchoidal fracture. Some fine brownish gray to gray, dense to silty-textured streaks and laminae.
1062.0	1063.0	Tuff and oil shale: medium brownish gray tuff (10YR 5/2) and medium to dark brownish gray oil shale (10YR 4/2-3/2). Massive silty-textured tuff and faintly streaked and laminated oil shale. Irregular mixed up core pieces; true length doubtful.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1063.0	1064.6	Oil shale: medium to dark brownish gray and brown (10YR 4/2 & 4/3-3/2, some 5/2-5/3). Moderately distinct smooth laminae to some very faint streaked bedding. Irregular to fairly regular thick parting; irregular to slightly conchoidal fracture. Rare fine dense buff to brownish gray lenses and streaks. Some high angle fractures with fine calcite crusts and very rare pyrite in upper part. A 1-inch dense light brownish gray tuff (?) with some very fine dark spots near base.
1064.6	1065.8	Oil shale: medium to very dark brownish gray and brown (10YR 4/2 & 4/3-2/2, rare 5/3). Faint smooth laminae and streaked bedding; some very fine loop structures and displacements. Slightly irregular to regular, thick to some thin parting; slightly irregular and rare slight hackly fracture. Some very fine dense tan lenses and streaks; rare very thin stringers and laminae near top.
1065.8	1067.4	Oil shale: medium to dark brownish gray and brown (10YR 4/2 & 4/3-3/2, some 5/2-5/3, rare 2/2). Very faint smooth laminae; common very fine loop structures. Fairly regular to some very irregular, thick to thin parting; slightly irregular to very irregular and conchoidal fracture. Rare fine dense brownish gray to gray streaks.
1067.4	1070.4	Oil shale: buff to some dark brownish gray (10YR & 2.5Y 7/2-4/2, some 3/2). Faint to distinct smooth laminae; very common fine loop structures and displacements. Regular to very irregular, thick to medium parting; irregular to very conchoidal fracture. Rare fine dense light gray to tan streaks and laminae. Some diagonal fractures with patchy calcite crusts and rare pyrite in upper part. Some distorted laminae at base.
1070.4	1070.6	Missing.
1070.6	1072.6	Oil shale: light to medium and rare dark brownish gray, some buff (2.5Y & 10YR 6/2-4/2, some 7/2, rare 3/2 upper part). Fairly distinct slightly distorted to smooth laminae; some fine loop structures and displacements. Irregular to fairly regular thick parting; irregular to conchoidal fracture. Fairly common fine dense to silty gray laminae and streaks. Some irregular pieces of light brownish gray to brown, massive, dense to silty and fine granular tuff in upper 0.4 foot (Mahogany marker?); true length doubtful.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of silty to fine granular tuff from 1070.9 feet: X-ray - <u>analcite</u> , <u>sanidine</u> .
1072.6	1076.3	Oil shale: light to medium and very rare dark brownish gray, some buff (10YR & 2.5Y 6/2-5/2, some 4/2 & 7/2, rare 3/2). Fairly distinct to faint smooth laminae; common fine loop structures and displacements. Regular to some very irregular, thick to medium parting; irregular to conchoidal fracture. Some fine dense to silty, gray to gray-buff streaks and laminae. Some nearly vertical to diagonal natural fractures with fairly common very fine pyrite. A 0.2-foot dense brownish gray faintly bedded tuff (?) with some very fine black streaks at base.
		Sample of very lean oil shale with gray to gray-buff laminae and streaks from 1074.8 feet: X-ray - quartz, dolomite, feldspar, calcite, pyrite.
1076.3	1079.9	Oil shale: black to very dark brownish gray (10YR 1/2-2/2, rare 3/2 lower part); very common satiny to some resinous luster. Very faint fairly smooth to distorted streaked bedding and some laminae. Fairly regular to very irregular and some wavy thick parting; very irregular fracture. Some to very common fine dense dark to medium brownish gray and brown stringers, streaks, and blebs. Common very contorted buff stringers and streaks in lower 0.2 foot. Some irregular mixed up core pieces; true length doubtful. (1077.5-1078.0 feet missing)
		Sample of black shale with common fine dense stringers, streaks, and blebs from 1078.6 feet: X-ray - quartz, dolomite, feldspar, <u>analcite</u> , <u>lawsonite?</u>
1079.9	1084.0	Oil shale: light to medium brownish gray and some buff (10YR & 2.5Y 6/2-5/2, some 7/2, rare 4/2). Faint to moderately distinct, <u>very</u> contorted and commonly intricately displaced laminae and stringers; some nearly vertical laminae. Very irregular parting and fracture. Some thick massive medium to light brownish gray stringers. Some black satiny to resinous oil-shale stringers in lower part. Some broken up and mixed up core; true length doubtful.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of buff to medium brownish gray contorted shale from 1081.7 feet: X-ray - quartz, dolomite, feldspar, calcite. Sample of thick massive medium brownish gray stringer from 1082.6 feet: X-ray quartz, feldspar, dolomite, calcite.
1084.0	1084.7	Oil shale: black to very dark brownish gray (10YR 1/2-2/2, some 3/2); common satiny luster. Faint distorted and wavy streaks and laminae. Very irregular parting; very irregular and slightly hackly fracture. Common fine dense brownish gray stringers, streaks, and blebs (like 1078.6 feet). Some interfingering stringers of buff to medium brownish gray oil shale in lower part. Very unconformable contact at base. Uneven sample split.
1084.7	1086.7	Tuff (?) and some oil shale: medium brownish gray and brown tuff (10YR 5/2-5/3) and buff to black oil shale (10YR 7/2-1/2). Lean oil shale with contorted and intricately displaced streaks and stringers in upper 0.3 foot; massive tuff with common fine dark oil-shale streaks and shreds in other parts. Irregular parting and fracture. Irregular mixed up core pieces in lower part; true length doubtful.
1086.7	1089.7	Oil shale: black to dark brownish gray (10YR 1/2-3/2); some slight satiny luster. Faint distorted streaks, stringers, and rare laminae. Irregular thick parting; very irregular to conchoidal fracture. Some thin massive brownish gray tuff stringers and streaks in upper part. Rare irregular tight natural fractures.
1089.7	1092.9	Oil shale: dark to medium brownish gray, some black in upper part (10YR 2/2-4/2, some 1/2); rare satiny luster. Faint distorted to some contorted streaks, stringers, and laminae. Very irregular to fairly regular thick parting; very conchoidal to irregular fracture. Fairly common dense brownish gray stringers, streaks and lenses. Common tight diagonal fractures with calcite in upper part.
1092.9	1094.0	Oil shale: black to dark and rare medium brownish gray (10YR 1/2-3/2, rare 4/2); rare satiny luster. Faint smooth laminae and streaks. Irregular to fairly regular thick parting; irregular to slightly conchoidal fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1094.0	1095.0	Oil shale: dark to medium brownish gray, rare tan near base (10YR 2/2-4/2, rare 5/2-6/3 lower part). Faint smooth laminae and streaks. Fairly regular to some irregular thick parting; irregular to slightly conchoidal fracture. Some low angle fractures with very fine crystalline calcite crusts near base.
1095.0	1096.2	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, some 5/2, rare 5/3 near base). Faint smooth to slightly distorted streaks, stringers, and rare laminae. Slightly irregular thick parting; irregular to slightly conchoidal fracture. Some very fine irregular black stringers and porous white crystalline patches near base.
1096.2	1097.0	Tuff: medium brownish gray (10YR 5/2). Very faint slightly irregular bedding to massive. Very irregular parting; irregular to conchoidal fracture. Some fine gray pyritic streaks and blebs. Rare irregular shreds of lean oil shale.
1097.0	1098.3	Sample of tuff from 1096.7 feet: X-ray - analcite, quartz, feldspar.
		Oil shale: medium brown to tan, some medium to dark brownish gray in upper part (10YR & 7.5YR 5/3-6/3, some 5/2-3/2 upper part). Moderately distinct to faint fairly smooth laminae; very common fine to small loop structures and displacements. Irregular thick parting; irregular to conchoidal fracture. A very irregular 0.3-foot brownish gray tuff (?) with common fine white crystalline blebs and very fine black bitumen specks at base.
1098.3	1099.3	Sample of tuff from 1098.2 feet: X-ray - quartz; some calcite, dolomite, analcite.
		Oil shale: medium brown and brownish gray to tan (10YR 5/3 & 5/2-6/3 & 6/2, some 4/2). Faint to fairly distinct fairly smooth laminae; very common fine loop structures and displacements. Slightly irregular to irregular thick parting; irregular to irregular thick parting; irregular to conchoidal fracture. Some vertical fractures with calcite crusts from 1098.5 to 1099.6 feet.
1099.3	1100.4	Oil shale: medium brown and some tan to dark brownish gray (10YR 5/3-3/2, some 6/3). Faint to fairly distinct fairly smooth laminae; common fine loop structures. Slightly irregular thick parting; irregular to conchoidal fracture. A very thin irregular brownish gray to buff fine blebby crystalline stringer at 1100.3 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from Bu Mines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1100.4	1104.2	Oil shale: dark brownish gray to black (10YR 3/2-1/2); some satiny to resinous luster. Very faint slightly distorted to smooth laminae and streaked bedding. Irregular to slightly irregular, thick to rare medium parting; irregular to conchoidal fracture. Rare zones with common fine dense dark brownish gray streaks, lenses, and blebs. A distinctly laminated dark brownish gray to tan and buff zone at 1101.6-1101.9 feet. A thin irregular yellowish buff tuff stringer with very fine dark stringers at 1103.1 feet. A high angle fracture with resinous black bitumen coatings near base.
1104.2	1104.6	Oil shale: medium brownish gray and brown to rare tan (10YR 4/2-5/2 & 5/3, rare 6/3). Moderately distinct fairly smooth laminae and streaks; some very fine distortions and displacements. Irregular parting and fracture. Some irregular tight natural fractures.
1104.6	1106.2	Oil shale and tuff (?): black to rare medium brown oil shale (10YR 1/2-3/2, rare 4/2-4/3) and medium brownish gray tuff (10YR 4/2-4/1). Distorted to smoothly laminated oil shale with common thin to medium tuff stringers in upper and lower parts; tuff with common very fine oil shale streaks in middle part. Irregular to regular, thick to medium parting; irregular and conchoidal to some fairly regular fracture. A very irregular 1/2- to 1-inch dense brown stringer at 1104.9 feet. A diagonal fracture with calcite crusts at 1105.6-1105.9 feet.
1106.2	1107.1	Tuff (?) and oil shale: medium brownish gray tuff (10YR 5/2 & 5/1-4/2 & 4/1) and black to dark brownish gray oil shale (10YR 1/2-3/2). Very faintly bedded tuff with very common distinct fine to thin, smooth to slightly distorted oil-shale streaks and stringers. Irregular to fairly regular thick parting; fairly regular to irregular fracture. A 1-inch band of medium brownish gray and brown oil shale at 1106.6 feet. Sample of tuff with very fine oil-shale streaks from 1106.3 feet: X-ray - calcite, quartz, dolomite; some analcite, feldspar.
1107.1	1108.0	Oil shale: very dark brownish gray to black (10YR 2/2-1/2, rare 3/2); rare slight satiny luster. Very faint very smooth laminae and streaked bedding. Very smooth thin shaly to papery parting; hackly fracture. Some irregular broken up fragments of crumbly porous oil-shale breccia in upper part; true length doubtful.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of oil shale from 1107.7 feet: X-ray - dolomite, quartz, feldspar, illite, analcite, pyrite.
1108.0	1109.5	Oil shale, very rich: very dark brownish gray to black (10YR 2/2-1/2); nearly all has resinous to waxy luster. Very faint smooth to some slightly distorted laminae and streaked bedding with fairly common very distinct medium brown laminae and streaks. Very smooth to slightly wavy, papery to some thick parting; hackly fracture.
		Sample of brown lamina from 1109.4 feet: X-ray - dolomite; some quartz, feldspar, analcite.
1109.5	1110.6	Oil shale, very rich: very dark brownish gray to black (10YR 2/2-1/2, rare 3/2); nearly all has resinous to waxy luster. Very faint smooth laminae; some fine to small loop structures. Very smooth to some wavy, thin to thick shaly parting; hackly fracture.
1110.6	1111.4	Tuff (?) and oil shale: light brownish gray and very rare tan to brown tuff (2.5Y & 10YR 6/2, rare 6/3-5/3 near base) and dark brownish gray to black oil shale (10YR 3/2-1/2). Very distinct fine to thin distorted oil-shale stringers and streaks in dense massive tuff. Slightly irregular to wavy thick parting; slightly irregular fracture. Interfingering contact with oil shale above; sharp smooth contact at base.
1111.4	1112.5	Oil shale, very rich: black to very dark brownish gray (10YR 1/2-2/2); nearly all has resinous luster. Very faint very smooth laminae; rare fine loop structures. Smooth to slightly wavy and rare irregular, thin to thick parting; hackly to slightly conchoidal fracture.
1112.5	1113.9	Tuff: light brownish gray to tan and some medium brown (10YR 6/2-6/3, some 5/2-5/3 upper part). Very faintly bedded with common very fine dark oil-shale streaks; some fine oil-shale stringers near top. Irregular thick parting; irregular to conchoidal fracture. Some broken up and mixed up core in middle part; true length doubtful.
		Sample of tuff from 1113.8 feet: X-ray - calcite; some quartz, dolomite, feldspar.
1113.9	1114.1	Missing.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1114.1	1115.0	Oil shale: very dark brownish gray to black (10YR 2/2-1/2, rare 3/2); some satiny to resinous luster. Very faint smooth laminae and streaked bedding. Smooth to very irregular, thin to thick parting; slight hackly to irregular fracture. Some natural high angle fractures with very fine patchy calcite crusts in upper part.
1115.0	1117.5	Oil shale: dark to rare medium brownish gray and black (10YR 3/2-2/2, rare 4/2 & 1/2); rare satiny to resinous luster. Faint smooth laminae and streaked bedding. Fairly regular to very irregular, medium to thick parting; slightly irregular to irregular fracture. Rare fine dense brown blebs and streaks. Some broken up and mixed up core in upper part.
1117.5	1119.0	Oil shale: very dark brownish gray to black (10YR 2/2-1/2, rare 3/2); common satiny luster. Very faint smooth to some distorted laminae and streaked bedding. Very irregular parting and fracture; some badly broken up and mixed up. Some irregular dark brownish gray to brown blebby tuff (?) stringers and lenses in middle part. True length doubtful. <div style="margin-left: 40px;">Sample of dark brownish gray blebby lens from 1117.9 feet:  X-ray - quartz, analcite, dolomite, feldspar, pyrite.</div>
1119.0	1120.4	Oil shale: dark brownish gray to black (10YR 3/2-1/2); common satiny luster. Very faint to faint smooth laminae and streaked bedding. Very irregular to some slightly wavy, thick to medium parting; irregular to conchoidal fracture.
1120.4	1121.0	Missing.
1121.0	1123.3	Oil shale: dark to some medium brownish gray (10YR 3/2-2/2, some 4/2). Faint fairly smooth laminae. Fairly regular to irregular thick parting; irregular to conchoidal fracture. Some high angle fractures with calcite crusts in upper part.
1123.3	1124.4	Oil shale: dark and rare medium brownish gray to some black (10YR 3/2-2/2, some 1/2, rare 4/2); rare satiny luster. Very faint slightly distorted streaked bedding to faint smooth laminae. Irregular thick parting; irregular fracture. Common fine dense dark brownish gray streaks and lenses in upper part.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1124.4	1127.4	Oil shale: very dark brownish gray to black (10YR 2/2-1/2, some 3/2 upper and lower parts); common satiny to resinous luster. Very faint smooth laminae and streaked bedding. Very irregular to slightly irregular, thick to medium parting; irregular to slightly conchoidal and some very slight hackly fracture. Some fine dark brownish gray, dense to very fine crystalline streaks and rare small blebby lenses in upper part.
1127.4	1128.5	Oil shale: dark brownish gray (10YR & 7.5YR 3/2-2/2). Very faint smooth laminae and streaked bedding. Slightly irregular thick parting; slightly conchoidal fracture. Rare bedding plane fractures with very fine calcite crusts. A fine vitreous black organic streak at 1127.9 feet.
1128.5	1129.6	Oil shale: dark brownish gray (10YR 2/2-3/2). Very faint smooth streaked bedding. Irregular to fairly smooth thick parting; conchoidal fracture. Sample of very faintly bedded dark brownish gray oil shale from 1129.2 feet: X-ray - dolomite, quartz, calcite, aragonite, analcite.
1129.6	1134.2	Oil shale: dark to rare medium brownish gray and black (10YR 3/2-2/2, rare 4/2 & 1/2). Very faint smooth and rare slightly distorted streaked bedding. Irregular to some fairly regular thick parting; slightly conchoidal to irregular fracture. Some high angle fractures with calcite crusts in upper half. Some black satiny oil shale from 1132.8 to 1133.2 feet.
1134.2	1135.3	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, some 2/2 upper part). Very faint smooth streaked bedding to faint distorted laminae; some large loop structures and displacements in lower part. Irregular thick parting; conchoidal to very irregular fracture. Some fine irregular fractures with black to buff crystalline fillings at 1134.7 feet. Irregular mixed up core pieces in lower part; true length doubtful. Sample of oil shale with crystalline fracture fillings from 1134.7 feet: X-ray - calcite, dolomite, quartz, aragonite, analcite, pyrite, feldspar.
1135.3	1136.0	Missing.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMiner-AEC Colorado Corehole No. 1--Continued

From	To	Description
1136.0	1137.0	Oil shale: dark brownish gray to black (10YR 3/2-1/2); some satiny luster. Very faint smooth laminae and streaked bedding. Slightly irregular to smooth, thick to medium parting; slightly irregular to slight hackly fracture.
1137.0	1138.0	Oil shale: dark brownish gray and brown to some black in upper part (10YR 2/2-3/2 & 3/3, some 1/2), dark to medium brownish gray in lower part (10YR 2/2-4/2); some satiny to rare resinous luster in upper part. Very faint to moderately distinct, distorted to smooth laminae. Irregular to fairly smooth, thick to rare thin parting; slightly irregular to slight hackly fracture. Some small dark brownish gray, dense to very fine crystalline lenses and fine stringers in upper part.
1138.0	1138.6	Tuff and oil shale: medium brown and brownish gray tuff (10YR & 7.5YR 5/3-4/3 & 4/2) and dark brownish gray oil shale (10YR 2/2-3/2). Dense to silty-textured tuff with common fine to thick oil-shale stringers. Irregular parting and fracture. Very rare very fine chalky white specks.
		[ Sample of brown tuff from 1138.1 feet: X-ray - albite, quartz, ferroan?
1138.6	1140.0	Oil shale: dark to medium brownish gray and some black (10YR 2/2-4/2, some 1/2 upper part); some resinous luster in upper part. Faint distorted streaked bedding to smooth laminae. Irregular thick parting to very regular thin parting; irregular to hackly fracture. Some fine dense brown stringers and streaks.
1140.0	1141.3	Oil shale: medium to dark brownish gray (10YR 4/2-3/2). Faint smooth laminae; rare fine displacements. Regular to very irregular, medium to thick parting; slightly conchoidal to very irregular fracture. Common medium to high angle natural fractures--some very tight. Some badly broken up and mixed up core; true length doubtful.
1141.3	1143.3	Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Faint smooth laminae. Very smooth to some irregular, thick to medium parting; irregular to conchoidal and some very slight hackly fracture. Some high to low angle fractures with very fine calcite crusts.
		[ Sample of oil shale from 1141.8 feet: X-ray - dolomite, quartz, calcite, analcite, feldspar, pyrite, illite.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1143.3	1144.3	Oil shale: dark and some medium brownish gray (10YR 3/2-2/2, some 4/2 upper part). Very faint smooth laminae and streaked bedding. Very regular to irregular, thin to thick parting; slightly irregular and conchoidal to some coarse hackly fracture. Common tight high to low angle fractures with very fine calcite crusts.
1144.3	1145.3	Oil shale: dark brownish gray to black (10YR 3/2-1/2); some satiny luster. Very faint smooth laminae. Very irregular to slightly irregular, thick to medium parting; irregular to some hackly fracture. Common natural diagonal fractures in upper part.
1145.3	1146.5	Oil shale: dark and rare medium brownish gray (10YR 3/2-2/2, rare 4/2). Faint smooth laminae and streaked bedding. Very irregular to slightly irregular thick parting; conchoidal to irregular fracture. Several very fine tight high angle, calcite-filled fractures with fine edges of brown to tan bleached shale from 1145.5 to 1146.2 feet.
1146.5	1148.5	Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Very faint smooth to very distorted laminae and streaked bedding. Irregular thick parting; irregular fracture. Some irregular mixed up core pieces in middle part; true length doubtful.
1148.5	1150.5	Missing.
1150.5	1153.0	Oil shale: dark to medium brownish gray and some black (10YR 2/2-4/2, some 1/2); rare satiny to resinous luster. Faint slightly distorted to smooth streaked bedding; very faint smooth laminae in lower 0.4 foot. Irregular thick parting; irregular to conchoidal fracture. Some very irregular pieces of brownish gray to buff contorted oil shale near top with some small irregular cavities with fine drusy crystals.
1153.0	1154.1	Oil shale: dark brownish gray to some black (10YR 3/2-2/2, some 1/2). Faint smooth laminae. Very irregular parting and fracture. Common high angle fractures with calcite crusts and some vitreous black organic material. A very thin light brownish gray earthy to silty tuff stringer near top. Some badly broken up and mixed up core; true length doubtful.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1154.1	1155.1	Oil shale: dark to some medium brownish gray and rare black (10YR 3/2-2/2, some 4/2, rare 1/2). Faint smooth and rare slightly distorted laminae. Irregular parting and fracture. Some tight diagonal to vertical calcite-filled fractures.
1155.1	1155.8	Oil shale: as above. Very badly broken up and mixed up; true length doubtful.
1155.8	1157.1	Missing.
1157.1	1159.1	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, rare 2/2). Faint smooth laminae. Irregular thick to medium parting; irregular to conchoidal fracture. Some very fine tight irregular nearly vertical calcite-filled fractures. Two double-cut core pieces at top.
1159.1	1161.2	Oil shale: medium to rare dark brownish gray and brown (10YR 4/2 & 4/3-5/2 & 5/3, rare 3/2-2/2 upper part). Faint to distinct, fractured to brecciated laminae in upper 0.6 foot; faint smooth laminae and streaked bedding in lower part. Very irregular to slightly irregular thick parting; very irregular to slightly conchoidal fracture. Common very fine drusy crystals and yellowish orange limonite stains in brecciated shale. Some very irregular mixed up core pieces in lower part; true length doubtful.
1161.2	1163.6	Oil shale: dark brownish gray (10YR 3/2). Very faint smooth streaked bedding. Irregular thick parting; conchoidal fracture. Rare small dense to silty-textured medium brownish gray nodules. Very rare very fine pyrite streaks. Very uniform and featureless.
1163.6	1165.1	Missing.
1165.1	1165.7	Oil shale: medium to rare dark brownish gray and brown (10YR 4/2 & 4/3-5/2 & 5/3, rare 3/2). Faint to very faint, distorted to fairly smooth streaked bedding. Irregular thick parting; irregular to slightly conchoidal fracture. A <u>small irregular vug</u> with radiating platy boxworks near top.
1165.7	1166.9	Tuff (?) and oil shale: light to medium brownish gray tuff (10YR 6/2-5/2) and medium to dark brownish gray oil shale (10YR 4/2-3/2). Dense massive tuff with common thin to very fine distorted oil-shale stringers, streaks, and shreds. Irregular parting and fracture. Sample of tuff from 1166.5 feet: X-ray - calcite, dolomite, quartz, aragonite, feldspar.

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Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1166.9	1167.4	Oil shale: dark and rare medium brownish gray (10YR 3/2, rare 4/2). Very faint fairly smooth streaked bedding. Irregular thick parting; irregular to conchoidal fracture. A diagonal fracture with very fine calcite crusts in lower part. Sample of oil shale from 1167.2 feet: X-ray - dolomite, aragonite, calcite, feldspar, quartz.
1167.4	1171.7	Tuff and oil shale: light to medium brownish gray and brown tuff (10YR 6/2-5/2 & 5/3) and medium to dark brownish gray oil shale (10YR 4/2-3/2, some 2/2). Dense massive tuff with common fine to rare thick, distorted to contorted oil-shale streaks and stringers. Irregular parting and fracture. Common irregular natural (?) fractures--some with calcite crusts.
1171.7	1174.0	Missing.
1174.0	1177.0	Oil shale: dark brownish gray (10YR 3/2, some 2/2); some fine black satiny to resinous streaks. Very faint smooth to very slightly distorted streaked bedding. Slightly irregular to irregular thick parting; conchoidal to irregular fracture. Some natural (?) vertical fractures.
1177.0	1179.0	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, rare 2/2). Faint smooth to slightly distorted streaked bedding. Very irregular parting and fracture. Common irregular natural fracture surfaces with calcite. Irregular mixed up core pieces; true length doubtful.
1179.0	1180.0	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, some 5/2, rare 2/2). Faint slightly distorted to smooth streaked bedding and some laminae. Very irregular thick parting; irregular to slightly conchoidal fracture. Some irregular natural fractures with calcite.
1180.0	1181.2	Oil shale: medium and rare dark brownish gray (10YR 4/2-5/2, rare 3/2). Faint smooth laminae and streaked bedding; some fine loop structures and displacements. Irregular thick parting; irregular to conchoidal fracture.
1181.2	1181.9	Missing.
1181.9	1183.8	Oil shale: dark brownish gray to buff (10YR 3/2-7/2). Faint fairly smooth to distorted streaked bedding and some laminae with common fine calcite-filled fractures to some finely brecciated porous zones. Very irregular parting and fracture. Light colored zones appear to be bleached.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of bleached oil shale with fine calcite-filled fractures from 1183.0 feet: X-ray - dolomite, calcite, quartz, feldspar.
1183.8	1184.9	Oil shale: medium and rare dark brownish gray (10YR 4/2, some 5/2, rare 3/2). Faint fairly smooth streaked bedding. Irregular thick parting; irregular to conchoidal fracture. Some very fine tight calcite-filled fractures.
		Sample of medium brownish gray oil shale from 1184.0 feet: X-ray - dolomite, feldspar, aragonite, quartz, calcite.
1184.9	1186.1	Oil shale: dark to medium brownish gray and some buff (10YR 3/2-5/2, some 6/2-7/2). Faint fairly smooth to distorted streaked bedding. Very irregular parting and fracture. Very common very fine tight calcite-filled fractures; some bleached shale. Fractures commonly have short open sections with drusy crystals.
1186.1	1187.1	Oil shale: light to medium and rare dark brownish gray (10YR 6/2-5/2, rare 4/2-3/2). Faint slightly distorted to smooth laminae. Irregular to some fairly regular, thick to medium parting; irregular fracture. Some fine calcite-filled fractures. Some irregular mixed up core pieces; true length doubtful.
1187.1	1189.0	Oil shale: medium to dark brownish gray and brown (10YR 5/2 & 5/3-3/2). Faint smooth to slightly distorted laminae and streaked bedding. Irregular parting and fracture. Rare very fine calcite-filled fractures.
1189.0	1191.7	Oil shale: dark to some medium brownish gray (10YR 3/2, some 4/2, rare 2/2). Faint smooth to slightly distorted laminae and streaked bedding. Irregular parting and fracture; commonly broken up and mixed up. Some natural fracture surfaces with calcite. True length doubtful.
1191.7	1199.0	Missing.
1199.0	1202.5	Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Very faint slightly distorted to contorted streaked bedding and rare laminae. Irregular parting and fracture. Some very irregular natural fractures. Rare small limonite-stained vugs with fine gray blebs. Lower part very badly broken up and mixed up; true length doubtful.
1202.5	1206.0	Missing.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1206.0	1208.8	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, very rare 2/2). Very faint smooth to rare distorted laminae. Slightly irregular to very regular thick parting; conchoidal to slightly irregular fracture. Some high angle fractures with very fine patchy calcite (?) crusts in upper part. Very rare very fine gray-buff laminae.
1208.8	1209.9	Oil shale: dark brownish gray (10YR 3/2-2/2). Faint smooth streaked bedding and some laminae. Regular to irregular, thick to medium parting; slightly irregular to very irregular fracture. Some irregular mixed up core pieces; true length doubtful.
1209.9	1210.5	Oil shale: medium to some dark brownish gray (10YR 5/2-4/2, some 3/2-2/2). Faint smooth laminae. Irregular parting and fracture. Some irregular natural fractures with chalky white coatings. Rare small dense brownish gray crystalline lenses.
1210.5	1212.0	Missing.
1212.0	1214.0	Oil shale: medium to some dark and rare light brownish gray (10YR 5/2-4/2, some 3/2, rare 6/2 upper part). Faint to rare moderately distinct smooth laminae; some very fine loop structures and displacements. Regular to some irregular thick parting; slightly irregular fracture. Some irregular natural fractures with chalky white to blue-gray coatings. Rare neutral gray laminae and streaks. <div style="margin-left: 40px;"> Sample of brownish gray shale with fine gray laminae from 1212.7 feet:  X-ray - dolomite, quartz, marcasite, feldspar, analcite, pyrite. </div>
1214.0	1215.1	Oil shale: medium to dark brownish gray (10YR 4/2-3/2). Very faint smooth laminae and streaked bedding. Regular to irregular, thick to thin parting; slightly conchoidal to irregular fracture. Common irregular natural fractures with slight chalky coatings. Badly broken up and mixed up; true length doubtful.
1215.1	1217.3	Oil shale: medium to dark brownish gray and brown (10YR 4/2 & 4/3-3/2, some 2/2, rare 5/3). Faint to moderately distinct smooth laminae; some fine loop structures. Fairly regular to irregular thick parting; irregular to slightly conchoidal fracture. Rare medium to light brownish gray dense crystalline laminae. Very badly broken up and mixed up near base; true length doubtful.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1217.3	1218.0	Missing.
1218.0	1218.6	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, some 2/2). Faint smooth laminae. Regular to irregular thick parting; irregular to conchoidal fracture.
1218.6	1220.0	Oil shale: very dark to very rare medium brownish gray (10YR 2/2-3/2, rare 4/2). Very faint smooth laminae and streaked bedding. Regular to some irregular thick parting; fairly smooth to conchoidal fracture. A short tight fracture with fine crystalline calcite at 1219.3 feet.
1220.0	1221.5	Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Faint smooth to slightly distorted streaks and rare laminae. Very irregular thick parting; fairly smooth to conchoidal and irregular fracture. Some diagonal fractures with very fine crystalline calcite.
1221.5	1224.0	Missing.
1224.0	1225.1	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, rare 2/2). Very faint distorted to fairly smooth streaked bedding and rare laminae. Irregular mixed up core pieces; true length doubtful.
1225.1	1226.1	Oil shale: dark to some medium brownish gray (10YR 3/2, some 4/2 & 2/2). Very faint distorted to contorted streaks and stringers. Irregular parting and fracture.
1226.1	1227.1	Oil shale and tuff: very dark to some medium brownish gray oil shale (10YR 2/2-3/2, some 4/2); some slight satiny luster. Faintly streaked oil shale with common very irregular thin, medium to dark brownish gray, dense to fine sandy-textured tuff stringers. Irregular parting and fracture. Rare fine crystalline stringers in tuff.
1227.1	1230.0	Missing.
1230.0	1233.3	Tuff and oil shale: medium to some light brownish gray tuff (10YR 5/2-4/2, some 6/2 lower part) and very dark to medium brownish gray oil shale (10YR 2/2-4/2). Distinct thin to rare thick contorted stringers. Very irregular parting and fracture. Common tight irregular natural fractures in some parts. Rare fine pyrite blebs in tuff. Texture of tuff ranges from very fine blebby and silty to dense and some slightly earthy. Some very fine bitumen specks in blebby parts.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of blebby tuff from 1230.2 feet: X-ray - albite, quartz, ferroan?
		Sample of slightly earthy fractured tuff from 1232.6 feet: X-ray - quartz, feldspar, illite, dolomite?
1233.3	1234.8	Oil shale: dark to medium brownish gray and brown (10YR 3/2-4/2 & 4/3, some 2/2). Faint to moderately distinct smooth laminae; some fine loop structures. Very irregular thick parting; irregular to very conchoidal fracture. Common irregular natural fractures with very fine crystalline calcite. Some irregular mixed up core pieces; true length doubtful.
1234.8	1238.1	Missing.
1238.1	1240.2	Oil shale: dark to medium brownish gray and brown (10YR 3/2-5/2 & 5/3). Faint to distinct smooth laminae and some very faint streaked bedding. Very irregular mixed up core pieces--some very rounded. Some natural fracture surfaces with calcite. Rare very small dense gray pyritic lenses. True length very doubtful.
1240.2	1268.0	Missing.
B-groove		
1268.0	1270.5	Oil shale and marlstone: dark brownish gray to buff (10YR & 2.5Y 3/2-7/2, rare 2/2). Faint to some distinct smooth laminae. Very badly broken up and mixed up; some regular thin parting. Rare fine irregular cavities. True length very doubtful.
1270.5	1282.0	Missing.
1282.0	1283.0	Oil shale and marlstone: medium brownish gray to buff and gray-buff (2.5Y 5/2-7/2 & 7/1). Faint very smooth laminae. Very regular medium to thick parting; slightly irregular fracture. Very common very fine dark disseminated specks--some acicular (pyrite and/or pyrrhotite in part?). Some very fine buff earthy streaks and spots. A 2-inch rounded fragment of dark brownish gray faintly bedded oil shale at top.
		Sample of medium to light brownish gray oil shale with common fine dark specks and some buff earthy streaks from 1282.7 feet: X-ray - dolomite, feldspar, quartz?, illite.
1283.0	1284.4	Marlstone: buff and gray-buff to rare medium brownish gray (2.5Y 7/2 & 7/1-6/2, rare 5/2). Faint very smooth laminae. Very regular thick to medium parting (some unctuous parting surfaces); slightly irregular fracture. Very common very fine dark specks.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of gray-buff marlstone with common fine dark specks from 1283.9 feet: X-ray - dolomite, feldspar, quartz?, illite.
1284.4	1285.7	Oil shale: light to medium brownish gray and rare buff (2.5Y 6/2-5/2, rare 7/2 upper part). Faint very smooth laminae to very faint bedding. Very regular thick to medium parting; slightly irregular to irregular fracture. Common very fine dark specks. Rare very fine pyrite streaks and laminae. A small irregular cavity with very fine platy boxworks near base.
1285.7	1286.8	Oil shale: medium to some dark brownish gray (2.5Y 5/2-4/2, some 3/2 lower part). Very faint smooth laminae and streaked bedding. Very regular to irregular, thin to thick parting; slightly conchoidal to irregular fracture. Some small irregular cavities near top. A fine dense tan lamina at 1286.1 feet. Common very fine cavities with some buff earthy fillings in middle part. Very common very fine white crystalline streaks in lower 0.2 foot.
		Sample of medium to dark brownish gray shale with very fine white crystalline streaks from 1286.7 feet: X-ray - dolomite, feldspar, quartz, calcite, pyrite, illite.
1286.8	1288.3	Oil shale: medium to very rare dark brownish gray (2.5Y 5/2-4/2, rare 3/2-2/2). Very faint smooth to distorted bedding. Very badly broken up and mixed up. Some fine to small cavities with common pyrite. Rare fragments of brecciated shale. True length very doubtful.
1288.3	1291.2	Missing.
1291.2	1292.4	Oil shale: dark and some medium brownish gray (10YR 3/2-2/2, some 4/2). Faint distorted to smooth streaked bedding. Irregular thick parting; irregular to conchoidal fracture. Some irregular mixed up core pieces in upper part.
1292.4	1295.0	Oil shale: medium brown to tan and buff (10YR 4/3-6/3 & 7/2). Faint to very distinct smooth laminae; some fine loop structures and displacements. Regular to irregular thick to rare medium and thin parting; slightly conchoidal to irregular fracture. Some fine gray pyritic streaks. Rare very tight natural fractures.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1295.0	1297.0	Missing.
1297.0	1298.5	Oil shale: medium brownish gray and brown to tan and buff (10YR 4/2 & 4/3-6/3 & 7/2, very rare 8/2). Distinct smooth laminae; some fine to small loop structures and displacements. Regular to some irregular thick parting; slightly conchoidal to irregular fracture. Some natural (?) high angle fractures. A 1-inch piece of gray-buff silty-textured tuff with fine buff marlstone streaks at top.
1298.5	1299.7	Oil shale: medium to dark brownish gray and brown, rare buff (10YR 5/2 & 5/3-3/2, some 6/2, rare 7/2). Moderately distinct smooth laminae to very faint streaked bedding; fairly common fine loop structures and displacements. Regular to some irregular thick parting; slightly conchoidal to irregular fracture. Very rare very fine vitreous black streaks in lower part.
1299.7	1300.5	Oil shale: medium to dark brownish gray (10YR & 2.5Y 4/2-3/2); common satiny to rare resinous streaks. Faint fairly smooth streaked bedding. Slightly irregular thick parting; slightly irregular fracture. Rare fine gray pyritic streaks and lenses.
1300.5	1301.2	Oil shale: medium brownish gray and brown (10YR 4/2-4/3, some 5/3). Faint smooth laminae and streaked bedding; a small horizontal fold at 1301.0 feet. Regular to slightly irregular, medium to thin parting; slightly irregular and conchoidal fracture. Some natural high angle fractures with very fine calcite crusts.
1301.2	1302.6	Oil shale: medium brown to very dark brownish gray (10YR 4/3 & 4/2-2/2, rare 5/3); some satiny to resinous luster. Moderately distinct to very faint, slightly distorted to smooth laminae; common fine to small loop structures and displacements. Slightly irregular to irregular thick parting; conchoidal to irregular fracture. Some irregular mixed up core pieces in lower part; true length doubtful.
1302.6	1304.2	Missing.
1304.2	1306.6	Oil shale: medium and rare dark brownish gray and brown to some buff (10YR 4/2 & 4/3-5/2 & 5/3, some 6/2-7/2, upper and lower parts, rare 3/2 middle part). Moderately distinct to very faint, smooth and rare very distorted laminae and streaked bedding; rare fine loop structures and displacements. Very irregular to some regular, medium to thick parting; irregular to conchoidal fracture. Some irregular natural fractures with calcite. Some irregular mixed up core pieces; true length doubtful.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1308.6	1308.6	Oil shale: medium to some dark brownish gray and some medium brown to rare tan (10YR 5/2-4/2, some 3/2 & 4/3-5/3, rare 6/3). Faint to some moderately distinct, smooth to slightly distorted laminae; rare very fine loop structures and displacements. Slightly irregular thick parting; slightly conchoidal to some very irregular fracture.
1308.6	1309.7	Oil shale: buff and tan to some very dark brownish gray (10YR 7/2 & 6/3-3/2, some 2/2). Very distinct to faint, smooth to some distorted laminae. Irregular thick parting; irregular to very conchoidal fracture. A 0.3-foot (?) brownish gray to brown silty-textured tuff with rare small gray blebs at 1309.0 feet. Some irregular mixed up core pieces; true length doubtful.
1309.7	1312.0	Missing.
1312.0	1313.0	Oil shale: medium to dark brownish gray and brown (10YR 4/2 & 4/3-3/2, some 5/2-5/3, rare 2/2). Moderately distinct to very faint smooth laminae; rare fine loop structures and displacements. Very irregular to slightly irregular, thick to medium parting; irregular to slightly irregular and conchoidal fracture. Very rare very fine vitreous black streaks.
1313.0	1314.0	Oil shale: medium and rare dark brownish gray (10YR 5/2-4/2, rare 3/2-2/2); rare resinous luster. Faint very smooth laminae. Regular to slightly irregular thick parting; slightly conchoidal to irregular fracture. Rare fine gray pyritic laminae and streaks.
1314.0	1315.0	Oil shale: medium and very rare dark brownish gray and brown (10YR 4/2 & 4/3-5/2 & 5/3, rare 3/2). Faint smooth laminae and streaked bedding. Slightly irregular to very irregular, medium to thick parting; conchoidal to irregular fracture. Rare fine dense gray pyritic streaks. Some irregular fractures with calcite in lower part.
1315.0	1316.3	Oil shale: medium and rare dark brownish gray and brown to tan and buff (10YR 4/2 & 4/3-6/3 & 7/2, rare 3/2). Distinct smooth laminae to very faint slightly distorted streaked bedding. Very badly broken up and mixed up; true length very doubtful.
1316.3	1322.0	Missing.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1322.0	1323.5	Oil shale: medium brownish gray (10YR 4/2-5/2). Faint fairly smooth to distorted streaked bedding. Very irregular thick parting; irregular to conchoidal fracture. Rare fine tan to buff crystalline streaks and blebs. Irregular fairly coarse boxworks with fine gray blebs and limonite stains on outside of core at 1322.3 feet. Some very irregular natural fractures with white coatings in lower part. Irregular discontinuous core pieces; true length doubtful.
1323.5	1326.8	Oil shale: medium to some light and dark brownish gray and brown, rare buff in lower half (10YR 4/2-5/2 & 5/3, some 3/2 & 6/2, rare 7/2). Very faint to rare moderately distinct, slightly distorted to smooth streaked bedding and laminae. Very irregular to some slightly irregular thick parting; slightly irregular to irregular and conchoidal fracture. Rare fine irregular gray silty-textured streaks. Very rare fine buff earthy to silty-textured porous streaks. Rare natural diagonal to nearly vertical fractures.
1326.8	1328.0	Missing.
1328.0	1329.0	Oil shale: medium brownish gray to buff and some medium brown to tan (10YR 4/2-7/2, some 5/3-6/3). Faint to distinct, smooth to some distorted laminae; some very small folds and unconformities in middle part. Slightly irregular thick parting; irregular to slightly conchoidal fracture. Rare nearly vertical to diagonal natural fractures. Some very fine buff slightly earthy streaks at 1328.3 feet.
1329.0	1330.0	Oil shale: medium brownish gray and rare medium brown to tan (10YR 4/2-5/2, rare 5/3-6/3). Faint smooth to some slightly distorted laminae and streaked bedding. Very irregular to some regular, thick to medium parting; irregular to some slightly conchoidal fracture. Rare fine dense gray streaks. Some very irregular mixed up core pieces in upper part; true length doubtful.
1330.0	1331.2	Oil shale: medium to some dark brownish gray and rare brown (10YR 4/2-5/2, some 3/2, rare 4/3-5/3). Faint smooth to some contorted laminae and streaked bedding. Regular to very irregular thick parting; slightly conchoidal to very irregular fracture. Common very irregular natural (?) fractures. Common very dense streaks and stringers in middle (?) part.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1331.2	1332.2	Dolomite (?): medium and some dark brownish gray (10YR 4/2-4/1, some 3/2). Very dense medium brownish gray dolomite with common fine dark distorted oil-shale streaks to contorted and shredded stringers. Very irregular thick parting; conchoidal to very irregular fracture. Some very irregular mixed up core pieces; true length doubtful. Sample of very dense dolomite (?) with some very fine oil-shale streaks from 1331.4 feet: X-ray - dolomite, calcite, quartz, feldspar, dawsonite.
1332.2	1333.6	Oil shale (?): dark to some medium brownish gray (10YR 3/2, some 4/2); very dense. Very faint contorted streaked bedding. Irregular thick parting; irregular to conchoidal fracture. Common very irregular dense brownish gray to gray dolomite (?) stringers in upper part. Interfingering contact with brown dolomite (?) below. Sample of dense dark brownish gray oil shale (?) from 1333.3 feet: X-ray - dolomite, quartz, aragonite, feldspar, calcite, dawsonite.
1333.6	1334.4	Dolomite (?) and oil shale: medium brownish gray and brown dolomite (10YR 5/2 & 5/3-4/2) and dark brownish gray oil shale (10YR 3/2). Interfingering contorted stringers of fairly dense dolomite and oil shale; some massive dolomite with rare very fine oil-shale shreds and some very fine disseminated crystals. Irregular mixed up core pieces; common irregular natural fractures--some with slight blue-gray to buff earthy coatings. True length doubtful. Sample of medium brownish gray to brown massive dolomite (?) with very fine disseminated crystals and rare oil-shale shreds from 1334.3 feet: X-ray - quartz, dolomite, calcite, feldspar.
1334.4	1335.8	Oil shale: medium to very rare dark brownish gray (10YR 5/2-4/2, rare 3/2). Faint fairly smooth to distorted streaked bedding and rare laminae. Irregular parting and fracture. Common very irregular very fine tight fractures with white dolomite (?) fillings. Some massive dolomite (?) with common very fine disseminated crystals and some oil shale shreds in middle part (like 1334.3 feet).

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMinas-AEC Colorado Corehole No. 1--Continued

From	To	Description
1335.8	1336.8	Oil shale: medium to dark and rare light brownish gray (10YR 5/2-3/2, rare 6/2). Faint to moderately distinct, smooth to slightly distorted laminae and streaked bedding. Irregular mixed up core pieces; common irregular natural fractures. True length doubtful.
1336.8	1337.5	Oil shale: medium to dark brownish gray, some medium brown to tan in upper part (10YR 4/2-3/2, some 5/3-6/3 upper part). Faint smooth streaked bedding; some laminae in upper part. Slightly irregular thick parting; irregular to conchoidal fracture. <u>Fossil larvae</u> (?) on parting surface near top. Rare <u>very</u> fine disseminated crystals in lower part. Very abrupt color change at base. <div style="margin-left: 40px;">Sample of oil shale with rare very fine disseminated crystals from 1337.4 feet: X-ray - dolomite, feldspar, quartz, pyrite, <u>dawsonite</u>.</div>
1337.5	1338.5	Oil shale: medium to light brownish gray, rare buff near top (10YR 4/2-6/2, rare 7/2). Fairly distinct to faint, smooth to some distorted laminae and streaked bedding; rare small horizontal folds. Irregular thick parting; irregular to slightly conchoidal fracture. A smooth vertical fracture with dark reddish brown resinous coatings in upper 2 inches. Rare fine dark gray streaks and laminae in lower part. <div style="margin-left: 40px;">Sample of light brownish gray to buff oil shale from 1337.5 feet: X-ray - dolomite, quartz, feldspar, ferroan?, <u>dawsonite</u>.</div> <div style="margin-left: 40px;">Sample of fine dark gray silty-textured lamina in medium brownish gray oil shale from 1338.4 feet: X-ray - pyrite, dolomite, quartz, feldspar, <u>dawsonite</u>.</div>
1338.5	1339.7	Oil shale: medium to some dark brownish gray (10YR 4/2, some 5/2 & 3/2). Faint smooth to slightly distorted streaked bedding. Irregular thick parting; slightly irregular fracture. Occasional thin to fine dense brownish gray to gray dolomite (?) stringers. Rare very fine disseminated crystals.
1339.7	1339.8	Footage adjustment; core ends match.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1339.8	1341.2	Oil shale: medium to some dark brownish gray and rare light brownish gray to buff (10YR 4/2, some 3/2 & 5/2, rare 6/2-7/2). Faint to some moderately distinct distorted streaked bedding; rare small light colored inclusions with irregularly oriented laminae. Irregular thick parting; irregular to slightly conchoidal fracture. Some very thin to fine, medium to dark gray, dense to silty-textured stringers and streaks. Rare small vugs with irregular spongy boxworks, gritty gray material and some very fine crystals. <div style="margin-left: 40px;"> <p>Sample of material from small vug at 1340.2 feet:</p> <p>X-ray - pyrite, <u>dawsonite</u>, <u>analcite?</u>, quartz, aragonite?, calcite?, dolomite?</p> </div>
1341.2	1341.9	Dolomite (?): medium brownish gray (10YR 5/2-5/1). Massive, fairly dense; rare fine oil-shale shreds and irregular stringers. Irregular thick parting; irregular to conchoidal fracture. Some fine gray-buff to white silty-textured blebs and streaks. A vertical fracture with very fine dark brown to black resinous crusts and some chalky white spots extends through most of interval. Common very fine disseminated crystals.
1341.9	1343.0	Oil shale: dark to rare light brownish gray and tan (10YR 3/2-5/2, rare 6/2-6/3). Faint distorted streaked bedding to fairly distinct smooth laminae. Irregular to slightly irregular thick parting; irregular fracture. Some fine to thin, dark gray to black, silty to very fine crystalline stringers. Some fine dense gray stringers near base.
1343.0	1344.6	Dolomite (?): light to medium brownish gray (10YR & 2.5Y 6/1-5/1; some almost neutral gray). Massive, fairly dense to very fine crystalline; some fine to thin oil-shale stringers and shreds. Very irregular parting and fracture. Some very irregular natural fractures with fine spongy black crusts and rare tan earthy spots. A 3-inch band of dark brownish gray to tan and buff laminated oil shale at 1343.6 feet with contorted and shredded oil-shale stringers extending into dolomite above. <div style="margin-left: 40px;"> <p>Sample of dense to very fine crystalline dolomite(?) with rare fine oil-shale shreds from 1343.9 feet:</p> <p>X-ray - quartz, dolomite, calcite, feldspar, <u>dawsonite</u>.</p> </div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1344.6	1347.2	Dolomite (?): medium brownish gray (10YR 5/2). Massive, dense to very fine crystalline; some fine oil-shale shreds. Irregular thick parting; irregular to fairly smooth fracture. Some fine white blebs and streaks.
1347.2	1348.2	Dolomite (?) and oil shale: medium to light brownish gray and rare tan (10YR & 2.5Y 5/2-6/2, some 4/2, rare 6/3). Dolomite as above with thick zones of oil shale with moderately distinct contorted to smooth laminae. Irregular to some very smooth, thick to medium parting; irregular to slightly conchoidal fracture. A vertical fracture with very fine black crusts and rare fine tan spots in upper part. A fine gray crystalline stringer at 1347.8 feet.
1348.2	1354.0	Dolomite (?): medium brownish gray (10YR 5/2, some 4/2 lower part). Massive, dense to very fine crystalline; rare fine oil-shale shreds. Very irregular parting; irregular to conchoidal fracture. Common fairly tight vertical fractures with resinous brown coatings in upper part. Some fine buff to white spots in lower part. Some irregular mixed up core pieces; true length doubtful.
1354.0	1357.0	Missing.
1357.0	1359.4	Oil shale: medium to dark brownish gray and brown (10YR & 7.5YR 4/2 & 4/3-3/2, some 5/2-5/3). Faint distorted streaked bedding. Irregular parting and fracture. Fairly common small limonite-stained vugs with some fine drusy crystals and pyrite. Some very irregular core pieces; continuity doubtful.
1359.4	1361.5	Oil shale: medium to dark brownish gray and rare brown (10YR 4/2 & 4/1-3/2 & 3/1, rare 4/3-5/3). Faint smooth laminae; rare fine loop structures and displacements. Slightly irregular to very regular, thick to rare medium parting; irregular to slightly conchoidal fracture.
		Sample of oil shale from 1361.4 feet: X-ray - quartz, feldspar, dolomite, pyrite, dawsonite.
1361.5	1362.5	Oil shale: medium to dark brownish gray and very rare black (10YR 4/2-3/2, rare 2/2-1/2); rare resinous to waxy luster. Faint smooth laminae. Very smooth to some irregular thick parting; slightly conchoidal fracture. A fine tan fairly dense stringer at top. A very irregular 2-inch gray to yellowish gray, dense to silty mass in distorted shale at 1361.7 feet. A diagonal fracture with some fine buff-white earthy spots at 1362.2 feet.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of gray mass with some fine oil shale stringers from 1361.7 feet: X-ray - sanidine, quartz.
1362.5	1363.5	Oil shale: medium to dark brownish gray and some black (10YR 4/2-3/2, some 2/2-1/2); very rich waxy shale at 1362.9-1363.1 feet; rare resinous to waxy luster in other parts. Faint smooth laminae to slightly distorted streaks and stringers; rare large loop structures in very rich zone. Slightly irregular to irregular thick parting; slightly conchoidal to irregular fracture. Some fine dense orangish brown streaks and stringers at 1363.1-1363.3 feet.
		Sample of dark brownish gray shale with fine dense brown streaks and stringers from 1363.1 feet: X-ray - dolomite, quartz, feldspar.
1363.5	1365.0	Missing.
Core sequence may be incorrect from 1365.0 to 1367.1 feet.		
1365.0	1366.1	Oil shale: medium and rare dark brownish gray to some brown (10YR 4/2-5/2, some 5/3, rare 3/2 upper part). Faint smooth and some distorted laminae and streaked bedding. Very irregular parting; irregular to slightly conchoidal fracture. Some 1- to 2-inch vugs with very fine gray blebby radiating boxworks in upper part. Rare tight vertical fractures with very slight blue-gray to white coatings in middle part. Irregular mixed up core pieces in lower part; true length doubtful.
1366.1	1367.1	Oil shale: medium to rare dark brownish gray, some light brownish gray to buff in upper part (10YR 5/2-4/2, some 6/2-7/2, rare 3/2). Faint to moderately distinct smooth laminae in upper part; faint very distorted laminae and streaks in middle part; very faint smooth streaked bedding and very fine laminae in lower part. Irregular thick parting; conchoidal to irregular fracture. A fine light gray silty stringer at 1366.2 feet. A diagonal fracture with some very fine calcite crystals at 1366.6 feet.
1367.1	1368.1	Oil shale: medium brownish gray and some brown (10YR 4/2-5/2, some 5/3). Very faint very fine contorted laminae and streaked bedding. Very irregular parting and fracture; dense and heavy.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1368.1	1372.1	Missing.
1372.1	1373.3	Oil shale: medium brownish gray (10YR 5/2-4/2). Very faint contorted to fairly smooth streaked bedding. Irregular thick parting; irregular to conchoidal fracture; dense and heavy. A large vug with irregular boxworks at 1373.0 feet.
1373.3	1374.9	Oil shale: medium brownish gray and some brown to rare tan and buff (10YR & 2.5Y 5/2-4/2, some 5/3, rare 6/2 & 6/3-7/2). Fairly distinct to faint, intricately contorted to slightly distorted laminae in upper 0.5 foot; faint distorted to contorted streaks and stringers in lower part. Irregular thick parting; slightly conchoidal to irregular fracture. Some small vugs with fairly coarse boxworks in lower part.
1374.9	1375.6	Oil shale: medium to dark brownish gray and brown (10YR 4/2 & 4/3-3/2). Faint contorted to fairly smooth streaked bedding. Slightly irregular thick parting; slightly irregular and conchoidal fracture.
1375.6	1376.6	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, some 2/2); rare satiny luster. Faint contorted to fairly smooth streaks, stringers and laminae. Very irregular to slightly irregular thick parting; irregular fracture. Rare fine dense tan to brown streaks.
1376.6	1378.6	Oil shale: dark to medium brownish gray, some medium brown near top and bottom (10YR 3/2-4/2, some 4/3). Faint smooth to slightly distorted streaked bedding and rare laminae. Regular to irregular thick parting; slightly irregular and conchoidal fracture. A diagonal fracture with some very fine buff specks at 1377.3-1377.8 feet.
1378.6	1380.2	Oil shale: medium to some light and rare dark brownish gray (10YR & 2.5Y 5/2-4/2, some 6/2, rare 3/2). Faint smooth to some slightly distorted laminae. Irregular to regular thick parting; irregular to slightly conchoidal fracture. Rare very fine dense gray streaks.
1380.2	1382.6	Footage adjustment; core ends match.
1382.6	1383.9	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, rare 2/2). Faint smooth to slightly distorted streaked bedding; rare small oil shale inclusions with irregularly oriented laminae. Slightly irregular to irregular thick parting; slightly irregular and conchoidal fracture.
1383.9	1384.9	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, some 2/2). Faint smooth streaked bedding and laminae. Slightly irregular thick parting; slightly irregular and conchoidal fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1384.9	1385.9	Oil shale: very dark to medium brownish gray and rare black (10YR 2/2-4/2, rare 1/2); some satiny to rare resinous luster. Very faint to faint smooth laminae and streaked bedding. Slightly irregular to irregular thick parting; irregular to conchoidal fracture. A 1- x 2-inch brownish gray dense to very fine crystalline <u>tar-impregnated nodule</u> and some fine streaks at 1385.4 feet.
		Sample of very dark slightly satiny shale from 1385.0 feet:
		X-ray - dolomite, quartz, feldspar, ferroan?
1385.9	1386.9	Oil shale: medium and some dark to rare light brownish gray (10YR 4/2-5/2, some 3/2 upper part, rare 6/2 lower part); very rare satiny luster in upper part. Faint to very faint smooth laminae and streaked bedding. Regular to irregular, thick to medium parting; fairly smooth to irregular and conchoidal fracture.
1386.9	1388.4	Oil shale: medium to some light brownish gray (10YR 4/2-5/2, some 6/2). Very faint smooth laminae and streaked bedding. Regular to irregular, thick to medium parting; fairly smooth to irregular and conchoidal fracture. A small gray-buff silty-textured nodule at 1387.2 feet. Some natural diagonal fractures with very fine white specks.
1388.4	1390.2	Oil shale: medium and rare dark to light brownish gray and rare buff (10YR 5/2-6/2, rare 4/2-3/2 & 7/2). Faint smooth to some distorted laminae and streaked bedding. Very irregular thick to medium parting; conchoidal to irregular fracture. Some fine to small limonite-stained vugs. Rounded to irregular mixed up core pieces in upper part; true length doubtful.
1390.2	1390.9	Oil shale: dark brownish gray to rare black (10YR 3/2-2/2, rare 1/2); rare satiny luster. Faint smooth streaked bedding. Regular thick to medium parting; irregular to rare coarse hackly fracture.
1390.9	1391.6	Oil shale: medium to very rare dark brownish gray (10YR 5/2-4/2, rare 3/2). Faint smooth laminae and streaked bedding. Regular to slightly irregular thick parting; irregular to conchoidal fracture.
1391.6	1392.5	Oil shale: dark brownish gray to rare black (10YR 3/2-2/2, rare 1/2). Faint smooth to slightly distorted streaked bedding and rare laminae. Fairly regular to irregular, thick to medium parting; irregular to rare hackly fracture. A 3/4-inch dense to silty gray band at 1391.9 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of gray band from 1391.9 feet: X-ray - quartz, analcite, dolomite, feldspar, illite, pyrite.
1392.5	1394.4	Oil shale: dark to some medium brownish gray (10YR 3/2-3/1, some 4/2-4/1, lower part fairly common fine streaks of 2/2). Very faint to faint, smooth to slightly distorted streaked bedding. Slightly irregular to irregular thick parting; fairly regular to irregular fracture. Some fine to thin dense brown streaks and stringers. Some <u>very</u> fine disseminated crystals. Some very fine buff-white patchy crusts on parting surface at 1393.1 feet. A vertical fracture with slight dark brown tarry stains and some very fine yellowish buff blebs in lower 0.4 foot.
		Sample of shale with some very fine crystals from 1392.9 feet: X-ray - quartz, dolomite, calcite, feldspar, dawsonite, analcite, pyrite.
1394.4	1396.5	Missing.
1396.5	1397.5	Oil shale: medium and rare dark brownish gray (10YR 4/2-5/2, rare 3/2). Faint smooth laminae and streaked bedding. Very regular to some irregular, thick to medium parting; slightly conchoidal to irregular fracture. Rare very fine disseminated crystals and crystalline streaks. A natural (?) vertical fracture from 1396.9 feet to base.
1397.5	1398.7	Dolomite (?): medium brownish gray (10YR & 2.5Y 5/2-4/2). Dense and massive with fairly common fine distorted oil-shale streaks and shreds. Irregular parting and fracture. Some very fine disseminated crystals.
1398.7	1399.8	Oil shale: very dark brownish gray to black (10YR 2/2-1/2). Very faint fairly smooth to distorted streaked bedding; some very irregular distinct medium to dark brown dense stringers and streaks (probably like 1363.1 feet). Very irregular thick parting; irregular fracture. A very thin gray injected stringer at 1399.1 feet (like 1391.9 feet). Some irregular tight natural fractures in lower part.
1399.8	1402.8	Oil shale: very dark brownish gray to black (10YR 2/2-1/2). Very faint smooth to some distorted streaked bedding. Irregular thick parting; irregular to conchoidal fracture. Some thick irregular hard dense brownish gray stringers at top; rare fine dense dark brown streaks and stringers in other parts. A high angle fracture with some fine short to 3/4-inch bleached streaks parallel to bedding in upper part.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC. Colorado Corehole No. 1--Continued

From	To	Description
1402.8	1404.0	Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Very faint smooth streaked bedding to faint laminae. Slightly irregular to irregular, medium to thick parting; irregular and conchoidal to fairly smooth fracture. Rare very fine dark gray streaks in lower part.
1404.0	1405.0	Oil shale: dark to medium brownish gray and brown (10YR 3/2-4/2 & 4/3). Faint smooth laminae in upper and lower parts; contorted and finely fractured from 1404.3 to 1404.7 feet. Regular to irregular thick parting; slightly conchoidal to irregular fracture. Rare very fine dark gray pyritic streaks and laminae in upper part. Common fine bitumen fillings and some buff to white earthy blebs in fractured zone.
1405.0	1406.1	Oil shale: medium brown to some tan and dark brownish gray (10YR 4/3-5/3, some 6/3 & 3/2). Faint distorted to fairly smooth laminae and streaked bedding. Slightly irregular thick parting and conchoidal fracture to very badly broken up and mixed up; true length very doubtful.
1406.1	1412.1	Missing.
1412.1	1413.4	Oil shale: medium brown and some brownish gray to tan (10YR & 2.5Y 4/3-6/3, some 4/2). Very faint slightly distorted streaked bedding and rare moderately distinct laminae. Very irregular thick parting; slightly irregular to irregular and conchoidal fracture. A fairly large limonite-stained vug with irregular coarse boxworks on side of core at 1412.5 feet.
1413.4	1414.9	Oil shale: dark brownish gray to medium brown and some black (10YR 2/2-4/3, some 1/2); rare satiny luster. Faint fairly smooth streaked bedding to distorted streaks and stringers. Slightly irregular to very irregular thick parting; irregular fracture.
1414.9	1415.9	Oil shale: medium and very rare dark brownish gray (10YR 5/2-4/2, rare 3/2-2/2). Very faint smooth to slightly distorted streaked bedding and rare laminae. Irregular thick parting; slightly conchoidal to irregular fracture.
1415.9	1422.2	Missing.
1422.2	1424.7	Oil shale: medium brown to some dark brownish gray and black, very rare tan to buff (10YR 5/3-4/3, some 3/2-1/2, rare 6/3-7/2). Distinct distorted to contorted streaks, stringers, and laminae. Very irregular parting and irregular to conchoidal fracture; irregular discontinuous to mixed up core pieces. Some small limonite-stained vugs and vuggy parting surfaces.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of tan to black contorted shale from 1423.4 feet: X-ray - dolomite, feldspar, quartz, ferroan.
1424.7	1428.0	Missing.
1428.0	1428.9	Oil shale: medium brownish gray (2.5Y & 10YR 4/2-5/2). Very faint slightly distorted to smooth streaked bedding. Irregular to fairly regular thick parting; conchoidal fracture.
1428.9	1429.8	Oil shale: medium to very dark brownish gray and some black (10YR 4/2-2/2, some 5/2 upper part, some 1/2 lower part); rare slight satiny luster. Fairly distinct slightly distorted to smooth laminae and streaks; some fine loop structures. Slightly irregular thick parting; slightly irregular fracture. Very rare small dense orangish brown lenses.
1429.8	1435.4	Mudstone and siltstone (tuff?): light brownish gray to gray-buff (10YR 6/2-7/1), calcareous. Very faintly bedded to massive. Irregular to some regular, thick to medium parting; irregular and conchoidal to regular fracture. Tan to black laminated oil shale with intruded tuff in upper 0.1 foot. Some fine dark oil-shale streaks and stringers down to 1430.6 feet. Some irregular mixed up core pieces; true length doubtful.
		Sample of gray-buff silty tuff (?) from 1434.7 feet: X-ray - quartz, feldspar, dolomite, dawsonite, calcite?
1435.4	1437.2	Missing.
1437.2	1437.9	Siltstone and very fine sandstone (tuff?): gray-buff (10YR 7/1, rare 6/1), slightly calcareous. Very faint distorted streaks and stringers; common fine distinct oil-shale streaks and stringers in lower part. Irregular parting and fracture. Some tight irregular natural fractures in lower part. Some irregular mixed up core pieces; true length doubtful.
1437.9	1439.2	Oil shale: medium to dark and rare light brownish gray (10YR 4/2-3/2, rare 5/2-6/2). Faint smooth laminae and streaked bedding. Fairly regular thick parting; slightly irregular to slightly conchoidal fracture. Fairly common very fine gray pyritic streaks.
1439.2	1439.7	Oil shale: buff to dark brownish gray (10YR 7/2-3/2, rare 8/2). Very distinct smooth laminae; rare very fine loop structures and displacements. Regular thick parting; conchoidal to slightly irregular fracture. Some very fine pyrite streaks.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1439.7	1446.2	Marlstone and oil shale: very light buff to light brownish gray and tan, some medium brown to very rare dark brownish gray (10YR 8/2-6/2 & 6/3, some 5/3, rare 4/3-3/2). Distinct to some faint smooth laminae; some very fine loop structures. Slightly irregular to some irregular thick parting; slightly irregular to irregular fracture. Rare fine pyrite streaks and laminae. A 0.1-foot band of massive gray-buff mudstone (tuff?) at 1442.5 feet. Some mica flakes and rare fibrous shreds (lost circulation material) on outside of core and on some fracture surfaces in lower half. Badly broken up and mixed up near base; true length doubtful. <div style="margin-left: 100px;">                     Sample of buff marlstone from 1441.0 feet:                      X-ray - quartz, feldspar, dolomite, ferroan, dawsonite.                 </div>
1446.2	1447.0	Missing.
1447.0	1448.8	Oil shale: medium to light brownish gray and some buff (10YR & 2.5Y 5/2-6/2, some 4/2 & 7/2). Distinct fairly smooth laminae to very faint streaked bedding; some irregular core pieces with distorted to contorted streaks and stringers. Irregular to some fairly regular, thick to medium parting; irregular and conchoidal to some fairly smooth fracture. Rare very fine gray pyritic streaks. Some fine fractures and small vugs (?) with bitumen, pyrite, and fine fibrous crystalline blebs (dawsonite?) in lower half. Some very irregular mixed up core pieces; true length doubtful.
1448.8	1449.8	Oil shale: medium to dark and rare light brownish gray (10YR 4/2-3/2, some 5/2, rare 6/2 & 2/2). Faint to moderately distinct smooth laminae. Slightly irregular to irregular, thick to medium parting; slightly irregular and rare coarse hackly fracture. A thin brown tuff stringer at 1449.0 feet. Some short tight vertical fractures with white coatings in lower part.
1449.8	1450.9	Oil shale: medium to dark brownish gray (10YR & 2.5Y 4/2-3/2, rare 5/2 & 2/2); rare satiny to resinous luster. Faint and rare moderately distinct smooth to some contorted laminae; rare very fine loop structures. Irregular to fairly regular thick parting; very irregular to slightly irregular fracture. Rare very fine gray pyritic streaks. Some irregular natural (?) fractures.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1450.9	1451.4	Tuff: light brownish gray to tan (10YR 6/2-6/3), dolomitic. Massive, very fine sandy to silty textured. Irregular parting; slightly irregular fracture. A very tight vertical fracture extends through most of interval.
1451.4	1452.9	<p>Sample of tuff from 1451.1 feet:  X-ray - quartz, feldspar, dolomite.</p> <p>Oil shale: dark to some medium brownish gray and black (10YR 3/2-2/2, some 4/2 &amp; 1/2); some very slight satiny luster. Very faint smooth laminae and streaked bedding. Irregular to some regular thick parting; irregular fracture. Some very fine silty-textured pyritic (?) streaks. Some small yugs in upper part. 1/2- to 1-inch medium to light brownish gray tuffs in lower 3 inches.</p>
1452.9	1454.2	<p>Oil shale: dark to rare medium brownish gray and black (10YR 3/2-2/2, rare 1/2 &amp; 4/2-5/2); rare slight satiny luster. Faint smooth to slightly distorted laminae; common fine loop structures and displacements in lower part. Slightly irregular to some very irregular, thick to medium parting; irregular fracture. Some irregular pieces of brownish gray silty-textured tuff with fine oil shale stringers at 1453.3 feet. A thin irregular dense brownish gray to brown stringer at 1453.6 feet.</p> <p>Sample of dark brownish gray oil shale from 1453.8 feet:  X-ray - quartz, dolomite, <u>analcite</u>, feldspar, pyrite.</p>
1454.2	1460.6	Missing.
1460.6	1461.6	Oil shale: dark brownish gray and rare black (10YR 3/2-2/2, rare 1/2 upper part); rare slight satiny luster in upper part. Faint smooth laminae to very faint streaked bedding; common fine loop structures in upper part. Slightly irregular to irregular thick parting; irregular fracture. A nearly vertical natural (?) fracture extends through interval.
1461.6	1462.5	Oil shale: dark to medium brownish gray (10YR & 7.5YR 3/2-4/2, some 5/2 near base, rare 2/2). Very faint smooth streaked bedding. Irregular thick to medium parting; conchoidal to slightly irregular fracture.

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Laramie Petroleum Research Center, Laramie, Wyoming

April 6, 1967

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1462.5	1463.5	Oil shale: medium and some dark brownish gray to buff (10YR 4/2-7/2, some 3/2). Very distinct smooth laminae; rare fine to small loop structures. Irregular to some very smooth thick parting; irregular to conchoidal fracture. Some irregular mixed up core pieces with white-coated fracture surfaces in upper part; true length doubtful.
1463.5	1465.4	Oil shale: dark brownish gray to medium brown (7.5YR 3/2-5/3). Faint smooth streaked bedding. Regular to some irregular, thick to thin parting; slightly irregular to hackly fracture. Common fine to thin, earthy to porous streaks and bands (lighter colors). Lower part badly broken up and mixed up; true length doubtful. <div style="border-left: 1px solid black; padding-left: 10px; margin-left: 20px;"> Sample of brownish gray to brown earthy shale from 1464.3 feet:  X-ray - dolomite, feldspar, quartz, pyrite. </div>
1465.4	1466.5	Missing.
1466.5	1469.2	Oil shale: dark to some medium brownish gray (10YR 3/2-2/2, some 4/2 lower part). Faint slightly distorted to smooth streaked bedding. Irregular thick parting; irregular fracture. Rare very fine disseminated crystals. Very rare very fine pyrite blebs. Very irregular mixed up core pieces with very irregular natural (?) fracture surfaces in lower part; true length doubtful.
1469.2	1470.6	Missing.
1470.6	1471.7	Oil shale: very dark to rare medium brownish gray and brown (10YR 2/2-3/2, rare 4/2-4/3); common satiny luster. Faint to very faint, slightly distorted to smooth streaked bedding. Very irregular to slightly irregular thick parting; irregular fracture. Some very fine pyrite blebs. Irregular mixed up core pieces with common very small cavities in upper 0.3 foot; true length doubtful.
1471.7	1473.7	Oil shale: medium to dark brownish gray and brown (10YR 4/2 & 4/3-3/2). Faint smooth to distorted streaked bedding. Irregular thick parting; irregular fracture.
1473.7	1475.2	Oil shale: medium to dark brownish gray and rare medium brown to tan (10YR & 2.5Y 4/2-3/2, some 5/2, rare 5/3-6/3). Very faint fairly smooth to distorted streaked bedding; moderately distinct intricately contorted laminae at 1474.1-1474.4 feet. Irregular thick parting; irregular to conchoidal fracture. Some very irregular natural (?) fractures.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1475.2	1476.1	Oil shale: buff to medium brownish gray (10YR 7/2-4/2). Fairly distinct smooth laminae. Irregular to slightly irregular thick parting; irregular to slightly conchoidal fracture. Some high angle fractures with fine patchy buff crusts and rare resinous brown coatings.
1476.1	1476.7	Missing.
1476.7	1478.5	Oil shale: medium to rare light and dark brownish gray (10YR & 2.5Y 5/2-4/2, rare 6/2 & 3/2). Faint to some moderately distinct smooth laminae; rare fine to small loop structures. Slightly irregular to very regular, thick to medium parting; fairly smooth to slightly irregular and conchoidal fracture. Rare short vertical fractures with fine patchy white crusts in upper part.
		[ Sample of medium to light brownish gray oil shale from 1477.7 feet: X-ray - dolomite, feldspar, quartz, <u>analcite</u> .
1478.5	1479.5	Oil shale: light to medium brownish gray (2.5Y & 10YR 6/2-5/2, some 4/2). Faint to moderately distinct smooth laminae. Regular to irregular, thick to medium parting; slightly conchoidal to irregular fracture. Rare thin buff to tan, silty-textured to dense crystalline stringers in upper part. Some tight vertical fractures with fine white specks and resinous brown coatings. Some irregular rounded core pieces in middle part.
1479.5	1480.5	Oil shale: medium brownish gray and rare tan to buff (2.5Y & 10YR 5/2-4/2, rare 6/3-7/2 upper part). Faint and rare distinct laminae and streaked bedding; rare fine loop structures and displacements. Regular to irregular, thick to medium parting; slightly conchoidal to irregular fracture. Some tight vertical fractures with very fine white specks and resinous brown coatings in upper part.
1480.5	1481.5	Oil shale: medium to dark brownish gray and rare brown (10YR & 2.5Y 4/2-3/2, rare 4/3). Faint smooth laminae and streaked bedding; distorted streaked bedding in upper 0.1 foot. Irregular to regular thick parting; irregular to slightly conchoidal fracture. Some diagonal to vertical fractures with very fine white specks.
1481.5	1482.5	Oil shale: medium to dark brownish gray and some brown (10YR & 7.5YR 4/2-3/2, some 4/3). Faint very smooth laminae. Slightly irregular to regular, thick to medium parting; smooth to slightly conchoidal fracture. Some very fine gray pyritic streaks.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1482.5	1484.5	Oil shale: medium to dark brownish gray and some brown (10YR & 7.5YR 5/2-3/2, some 5/3-4/3). Faint smooth laminae. Regular to some irregular, thick to medium parting; irregular fracture. Some very fine gray pyritic streaks. Some irregular high angle fractures with very fine dolomite (?) crusts in upper part.
1484.5	1485.1	Missing.
1485.1	1486.8	Oil shale: medium to dark and rare light brownish gray (10YR 5/2-3/2, rare 6/2 lower part). Faint to moderately distinct smooth laminae and streaked bedding. Regular to irregular, thick to medium parting; irregular to slightly conchoidal fracture. Rare fine gray pyritic streaks. Rare irregular fractures with fine white specks.
1486.8	1488.2	Oil shale: buff and tan to medium brownish gray and brown (10YR 7/2 & 6/3-5/2 & 5/3, some 4/2-4/3). Fairly distinct smooth laminae. Regular thick parting and slightly conchoidal fracture to very irregular mixed up core pieces; true length doubtful.
1488.2	1492.1	Missing.
1492.1	1493.7	Oil shale: medium to some light and rare dark brownish gray (10YR 5/2-4/2, some 6/2 upper part, rare 3/2 lower part). Faint very smooth laminae and streaked bedding; very distorted laminae in upper 2 inches. Very regular and rare irregular, thick to medium parting; slightly irregular fracture. Some very fine gray pyritic streaks and laminae. Rare short very tight vertical fractures with chalky white and resinous brown coatings in upper part. A 3/4-inch fairly dense massive tan band at 1493.4 feet.
1493.7	1496.7	Oil shale: light to rare dark brownish gray and some tan to buff (10YR 6/2-4/2, some 6/3-7/2, rare 3/2). Moderately distinct to very distinct smooth laminae; rare very fine loop structures and displacements. Very regular to rare irregular, thick to medium parting; slightly irregular to smooth fracture. Some to very rare fine gray pyritic streaks and laminae. Rare short tight vertical fractures with brown coatings and very fine white specks.
1496.7	1497.7	Oil shale: tan to medium brown and some dark brownish gray (10YR 6/3-4/3 & 4/2, some 3/2). Distinct smooth laminae; common very fine loop structures and displacements. Slightly irregular to irregular thick parting; conchoidal to fairly smooth fracture. Rare very fine gray pyritic streaks.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1497.7	1499.5	Oil shale: medium brown and brownish gray to tan and rare buff (10YR 5/3 & 5/2-6/3, some 4/2, rare 7/2). Faint to rare fairly distinct, smooth to some very distorted streaks, stringers, and rare laminae. Irregular thick parting; irregular and conchoidal to fairly smooth fracture. Rare to fairly common very fine gray pyritic streaks and blebs.
1499.5	1500.3	Oil shale: medium to dark brownish gray and brown (10YR 4/2 & 4/3-3/2, rare 2/2). Faint slightly distorted to smooth laminae. Irregular thick parting; irregular to conchoidal fracture. Some tight natural high angle fractures.
1500.3	1501.3	Oil shale: dark brownish gray to black (10YR 3/2-1/2); some slight satiny to rare resinous and waxy luster. Faint to very faint, smooth to some distorted laminae and streaked bedding. Very irregular thick parting; slightly conchoidal to irregular fracture.
1501.3	1502.4	Oil shale: medium to dark brownish gray (10YR & 7.5YR 4/2-3/2, some 5/2 lower part). Faint to moderately distinct, distorted to contorted streaks and stringers. Irregular thick parting; irregular fracture. Very rare fine pyrite blebs. Rare small vugs near top; irregular coarse boxworks on side of core near base. <div style="margin-left: 40px;">Sample of medium to dark brownish gray distorted shale from 1501.9 feet:  X-ray - dolomite, feldspar, quartz, ferroan, analcite.</div>
1502.4	1510.2	Missing.
1510.2	1512.6	Oil shale: medium brownish gray and brown to rare tan (10YR 4/2 & 4/3-5/2 & 5/3, rare 6/3). Faint smooth laminae and streaked bedding. Regular to very irregular, medium to thick parting; irregular to slightly conchoidal fracture. Rare very fine dark gray streaks. A vuggy parting surface at 1512.0 feet. Some parts very badly broken up and mixed up; true length doubtful.
1512.6	1513.6	Oil shale: medium to light brownish gray and rare brown to tan (10YR 4/2-6/2, rare 4/3-6/3). Faint to moderately distinct fairly smooth laminae and streaked bedding; rare fine loop structures. Irregular thick parting; slightly conchoidal to irregular fracture. An irregular high angle fracture with some slight white coatings and very rare very fine pyrite extends through most of interval. Fairly smooth contact with tuff below.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1513.6	1514.8	Tuff: gray-buff to very light yellowish buff (7.5YR 7/1 to 2/5Y 8/2). Massive, silty textured, some <u>very</u> fine dark specks and streaks. Very irregular parting and fracture; badly broken up and mixed up; true length doubtful. Sample of tuff from 1513.7 feet: X-ray - quartz, feldspar, <u>dawsonite</u> , dolomite, <u>nahcolite</u> .
1514.8	1515.3	Oil shale: tan and rare buff to medium brownish gray (10YR 6/3-4/2, rare 7/2). Fairly distinct to faint smooth laminae; some fine loop structures and displacements. Irregular thick parting; smooth to slightly irregular and conchoidal fracture. A 1/2-inch gray silty-textured tuff stringer at 1515.2 feet. An irregular fracture with some very fine white patches near base.
1515.3	1518.1	Missing.
1518.1	1519.2	Oil shale: light to medium brownish gray and rare tan to buff (10YR 6/2-4/2, rare 6/3-7/2). Distinct to some faint smooth laminae and rare streaked bedding; wavy laminae near base. Very irregular to some slightly irregular thick parting; irregular to conchoidal fracture. Fairly common high angle fractures with white patches and rare brown coatings--some very tight. Slightly vuggy parting surfaces at base.
1519.2	1520.2	Oil shale: medium brownish gray and brown (10YR 4/2 & 4/3-5/2 & 5/3). Faint smooth laminae and streaked bedding. Slightly irregular to irregular thick parting; fairly smooth to irregular fracture. Some very fine gray streaks and laminae. Some irregular very tight vertical fractures. Rare fine brown crystalline stringers with some bitumen in middle part.
1520.2	1521.4	Oil shale: medium to very rare dark brownish gray and some brown (10YR 4/2-5/2, some 4/3-5/3, rare 3/2). Faint smooth laminae and rare slightly distorted streaked bedding. Slightly irregular to irregular thick parting; irregular to slightly conchoidal fracture. Some irregular mixed up core pieces in middle part; true length doubtful.
1521.4	1522.1	Missing.
1522.1	1523.5	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, some 5/2 upper part). Faint to very faint smooth laminae. Very irregular parting and fracture. Common nearly vertical to diagonal fractures with chalky white coatings.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1523.5	1526.0	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, rare 2/2). Faint to very faint smooth laminae and streaked bedding. Regular to some irregular thick parting; slightly irregular to irregular fracture. Rare diagonal fracture with very fine blebby white crusts.
1526.0	1527.0	Oil shale: medium to dark brownish gray and some brown (10YR 4/2-3/2, some 4/3). Faint smooth laminae and streaked bedding. Slightly irregular to irregular thick parting; irregular to slightly conchoidal fracture. Rare tight vertical fractures with white coatings.
1527.0	1528.0	Oil shale: medium to very rare dark brown and brownish gray (10YR 4/3-4/2, some 5/3, rare 3/2). Faint smooth laminae. Slightly irregular to regular thick parting; slightly conchoidal to irregular fracture. A 1-inch distorted zone with common very fine buff crystalline streaks and stringers at 1527.4 feet. <div style="margin-left: 40px;"> <p>Sample of oil shale with fine crystalline streaks and stringers from 1527.4 feet:  X-ray - dolomite, <u>analcite</u>, feldspar, quartz, <u>dawsonite</u>.</p> </div>
1528.0	1529.0	Oil shale: medium to some dark brownish gray and brown (10YR 4/2-4/3, some 3/2 upper part, rare 5/3 lower part). Faint to moderately distinct smooth laminae and rare very faint streaked bedding. Slightly irregular to regular thick parting; slightly irregular fracture. Rare short tight vertical fractures with white coatings.
1529.0	1530.0	Oil shale: medium to very rare dark brownish gray and some brown (10YR 4/2, some 4/3, rare 5/3 & 3/2). Faint smooth to some slightly distorted laminae. Regular to some irregular thick parting; slightly conchoidal to irregular fracture. Rare very fine gray streaks and laminae. A very irregular thin buff silty to very fine granular stringer with <del>rare</del> fine cavities at 1529.3 feet; some very irregular small porous crystalline masses in lower 0.2 foot.
1530.0	1531.0	Oil shale: medium to very rare dark brownish gray and brown (10YR 4/2-5/2, rare 5/3 & 3/2). Very faint to rare moderately distinct smooth laminae and streaked bedding. Regular to some irregular, thick to medium parting; slightly irregular to conchoidal fracture. A thin distorted zone with common very fine crystalline stringers near top (like 1527.4 feet).

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1531.0	1532.0	Oil shale: medium to very rare dark brownish gray and brown (10YR 4/2-4/3, rare 3/2). Very faint smooth laminae and streaked bedding. Slightly irregular to irregular thick parting; slightly irregular to irregular fracture. Very rare very fine gray streaks.
1532.0	1534.0	Oil shale: medium brown and rare brownish gray (10YR 4/3, some 5/3, rare 4/2-5/2). Very faint smooth streaked bedding and some laminae. Irregular thick parting; slightly irregular to irregular fracture. Very rare fine gray streaks and laminae.
1534.0	1535.2	Oil shale: medium brown and some brownish gray (10YR 4/3-5/3, some 2.5Y 4/2 lower part). Very faint smooth streaked bedding to some faint laminae. Irregular thick parting; slightly irregular to irregular and conchoidal fracture. Rare diagonal to vertical fractures with white coatings. Vuggy limonite-stained parting surface at base.
		[ Sample of brown laminated oil shale from 1534.6 feet: X-ray - dolomite, feldspar, quartz.
1535.2	1538.2	Missing.
1538.2	1539.5	Oil shale: medium to very rare dark brownish gray and brown, rare tan in upper part (2.5Y & 10YR 5/2 & 5/3-4/2 & 4/3, rare 6/3 & 3/2); very rare satiny to resinous luster. Faint distorted to smooth streaked bedding. Mostly irregular rounded mixed up core pieces; true length very doubtful.
1539.5	1541.0	Oil shale: medium to rare dark brownish gray (10YR 4/2, rare 5/2 & 3/2). Faint smooth to slightly distorted streaked bedding. Slightly irregular to irregular thick parting; slightly irregular fracture. Common very fine tan to buff earthy streaks and some black pyritic blebs. Some irregular natural (?) fractures.
		[ Sample of oil shale with some very fine buff streaks and black pyritic blebs from 1540.0 feet: X-ray - feldspar, dolomite, ferroan, pyrite, analcite.
1541.0	1542.5	Missing.
1542.5	1544.6	Oil shale: medium to rare dark brownish gray (10YR 4/2, rare 3/2 & 5/2). Very faint smooth laminae and streaked bedding. Slightly irregular to very regular, medium to thick parting; irregular to fairly regular fracture. Rare high angle fractures with white coatings. Some very fine black pyritic blebs and rare buff streaks in upper part. Some irregular pieces of massive brownish gray (2.5Y 5/2) mudstone in lower part. True length doubtful.



# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1544.6	1546.4	Oil shale: medium brown to dark brownish gray and rare black (10YR 4/3-2/2, rare 1/2); rare slight satiny luster. Moderately distinct to faint smooth laminae--becoming inclined about 30° at base. Regular to some irregular, thick to medium parting; irregular fracture. Rare very fine dense buff streaks and stringers in upper part.
1546.4	1547.1	Missing.
1547.1	1548.1	Oil shale: medium to dark brownish gray and brown (10YR 4/2 & 4/3-3/2, rare 5/3 & 2/2); rare satiny to resinous luster. Faint smooth to broadly curved laminae--inclined 30-40°. Slightly irregular to irregular thick parting; irregular fracture. Some vuggy parting surfaces. A fine vitreous black organic streak near top. Some tight low angle fractures with white coatings near base.
1548.1	1550.2	Oil shale: dark brownish gray to medium brown (10YR & 7.5YR 3/2-4/2 & 4/3, rare 2/2 upper part); rare slight satiny luster. Faint smooth laminae to some very faint bedding--inclined in upper part. Fairly regular to irregular, thick to medium and rare thin parting; slightly irregular and conchoidal fracture. Rare high angle fractures with fine white specks.
1550.2	1553.5	Tuff (?): medium brown to some tan (10YR 5/3, some 6/3), dolomitic. Massive; common very fine buff earthy specks. Irregular thick parting; slightly irregular to irregular fracture. Common fine pyrite streaks in upper 0.1 foot; very rare in other parts. Very regular contacts at top and bottom. Irregular mixed up core pieces at 1550.9-1551.2 feet; true length doubtful. <div style="margin-left: 40px;"> Sample of tuff with fine buff specks from 1552.5 feet:  X-ray - quartz, feldspar, dolomite, <u>dawsonite</u>, pyrite. </div>
1553.5	1554.7	Marlstone and oil shale: buff and tan to medium brownish gray (10YR 7/2 & 6/3-5/2, rare 4/2). Faint smooth laminae in upper part to very faint streaked bedding in lower part. Regular to irregular thick parting; slightly conchoidal to irregular fracture. Some very fine dark gray pyritic streaks and specks. Some very small brown to tan crystalline blebs in lower 0.2 foot. Some very irregular mixed up core pieces; true length doubtful.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1554.7	1561.0	Missing.
1561.0	1562.7	Oil shale: medium to some dark and rare light brownish gray (10YR & 2.5Y 5/2-4/2, some 3/2, rare 6/2 & 2/2). Very faint to faint smooth streaked bedding and some laminae. Slightly irregular to irregular, thick to medium parting; slightly irregular to some very irregular fracture; very dense texture. Some very fine pyrite blebs and rare streaks. Rare short diagonal to vertical fractures--some slightly open. <div style="margin-left: 40px;">Sample of dense brownish gray oil shale with some very fine pyrite from 1562.4 feet:  X-ray - dolomite, feldspar, quartz, calcite, pyrite, illite.</div>
1562.7	1563.5	Oil shale: yellowish tan in upper 0.2 foot (2.5Y 6/3), medium brownish gray and brown in other parts (10YR & 2.5Y 5/2-5/3, rare 4/2 near base). Very faint smooth streaked bedding and some faint to rare moderately distinct laminae. Irregular to very regular thick parting; irregular and conchoidal to fairly smooth fracture; very dense texture. Some fine gray pyritic streaks and laminae. Common very fine black specks in middle part. <div style="margin-left: 40px;">Sample of dense brownish gray oil shale with common very fine black specks from 1563.1 feet:  X-ray - feldspar, dolomite, quartz, ferroan.</div>
1563.5	1566.0	Oil shale: medium brownish gray (10YR 4/2, rare 5/2). Very faint smooth laminae and streaked bedding. Regular to irregular thick parting; fairly smooth to irregular and conchoidal fracture; dense. Common very fine gray pyritic streaks. Common very fine black specks in some parts. A thin orangish buff to tan earthy stringer at 1564.1 feet. Common irregular high angle fractures with some fine patchy buff to white crusts in lower part. Common <u>very</u> fine buff earthy streaks (only apparent on parting surfaces). <div style="margin-left: 40px;">Sample of buff to tan earthy stringer from 1564.1 feet:  X-ray - sanidine, some albite.  <div style="margin-left: 40px;">Sample of dense oil shale with common very fine gray and buff streaks from 1564.8 feet:  X-ray - feldspar, dolomite, analcite, pyrite, illite.</div></div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1566.0	1567.2	Oil shale: medium to very rare dark brownish gray and brown (10YR 4/2-4/3, rare 5/3 & 3/2). Faint smooth laminae. Very regular to some irregular thick parting; slightly irregular to irregular and conchoidal fracture; dense. Common very fine gray pyritic streaks and laminae in upper part.
1567.2	1569.0	Oil shale: medium brownish gray and brown, rare tan in upper part (2.5Y & 10YR 5/2 & 5/3-4/2 & 4/3, rare 6/3). Faint smooth to distorted streaked bedding and rare laminae. Very irregular mixed up core pieces with very common buff earthy weathered (?) surfaces. Common very fine disseminated crystals and very fine pyrite blebs. Fairly common fine cavities and rare large vugs with very fine platy boxworks. True length very doubtful. <div style="margin-left: 40px;">Sample of oil shale with disseminated crystals, fine cavities, and slightly weathered (?) surfaces from 1568.1 feet:  X-ray - dolomite, feldspar, quartz, ferroan, illite.</div>
1569.0	1577.0	Missing.
1577.0	1577.5	Oil shale: medium brown to rare dark brownish gray (10YR 4/3-4/2, rare 5/3 & 3/2, some 2.5Y 5/3). Faint smooth to some distorted laminae and streaked bedding. Irregular mixed up core pieces; some very smooth parting. Rare small to large vugs with very fine boxworks. True length doubtful.
1577.5	1578.8	Oil shale: medium to some dark brown and rare brownish gray (10YR 4/3-5/3, some 3/3, rare 3/2, rare 2.5Y 5/3-5/2). Faint smooth to some very distorted laminae. Regular to very irregular, thin to thick parting; slightly irregular to very irregular fracture. Common fine yellowish tan earthy porous lenses and streaks. Common small to fairly large irregular vugs in distorted shale in lower part. Some very fine pyrite blebs. <div style="margin-left: 40px;">Sample of medium to dark brown shale with fine buff streaks and lenses from 1578.1 feet:  X-ray - dolomite, quartz, feldspar, magnesite, illite.</div>
1578.8	1580.3	Oil shale: medium to rare light brownish gray and brown (10YR 4/2 & 4/3-5/2 & 5/3, rare 6/2). Faint smooth laminae and streaked bedding--some inclined up to 25°. Regular to very irregular, thick to medium parting; fairly smooth to very irregular fracture. Common irregular high angle fractures with earthy buff coatings and some dark brown organic crusts. Mostly very irregular mixed up core pieces; true length very doubtful.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1580.3	1582.3	Oil shale: medium to dark brownish gray (2.5Y 4/2-3/2, rare 5/2). Faint smooth to slightly distorted streaked bedding. Fairly regular to irregular thick parting; slightly irregular to irregular fracture. Rare very short very tight high angle fractures.
1582.3	1583.1	Missing.
1583.1	1584.4	Oil shale: medium to rare light brownish gray and tan (2.5Y 5/2-4/2, some 4/1, rare 6/2-6/3; some slight olive tint). Very faint smooth streaked bedding and rare laminae. Very irregular thick parting; conchoidal to very irregular fracture. Some very fine gray pyritic streaks and blebs. Irregular mixed up core pieces in upper part; true length doubtful.
1584.4	1585.4	Oil shale: medium brownish gray (2.5Y & 10YR 5/2-4/2). Faint smooth streaked bedding. Irregular to regular, thick to medium parting; slightly irregular fracture. Common very fine gray pyritic streaks and rare blebs.
1585.4	1587.4	Oil shale: medium to dark brownish gray (2.5Y 4/2 & 4/1-3/2 & 3/1; common slight olive tint). Very faint smooth laminae and streaked bedding. Irregular thick parting; irregular to conchoidal fracture. Very rare fine black pyritic streaks.
1587.4	1588.7	Missing.
1588.7	1590.5	Oil shale: as above. Badly broken up and mixed up core with common natural fracture surfaces in lower part. A fine vitreous black striated organic crust on parting surfaces at 1589.9 feet. True length doubtful.
1590.5	1591.9	Oil shale: medium brownish gray and brown (10YR & 2.5Y 4/2-4/3, rare 4/1). Very faint smooth laminae and streaked bedding. Slightly irregular to very irregular, thick to medium parting; slightly conchoidal to very irregular fracture. Common very fine buff earthy blebs and some very fine cavities in lower part. Irregular mixed up core pieces in lower part; true length doubtful.
1591.9	1597.1	Missing.
1597.1	1598.7	Oil shale: medium to dark brownish gray (2.5Y 4/2-3/2, rare 2/2 middle part; some slight olive tint). Very faint smooth laminae and streaked bedding. Regular to some irregular, thin to thick parting; irregular to some hackly fracture. Common fine buff earthy porous streaks with very fine pyrite from 1597.7 to 1598.2 feet; rare in other parts. A fine tan lamina with very fine pyrite blebs at 1597.5 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1598.7	1601.1	Oil shale: medium to light brownish gray (10YR 5/2-6/2, some 2.5Y 5/2-4/1). Very faint smooth streaked bedding and some laminae. Very irregular mixed up core pieces. Common very fine buff earthy blebs and streaks. True length very doubtful.
1601.1	1615.0	Missing.
1615.0	1616.6	Oil shale: medium to rare light brownish gray and olive gray (2.5Y & 5Y 5/1-4/1, some 5/2-4/2, rare 6/1). Very faint smooth to slightly distorted streaked bedding. Very irregular mixed up core pieces; some natural fracture surfaces with patchy dark brown to black coatings. Rare tan laminae with very fine dark blebs in upper part. Some fine gray pyritic streaks and blebs in brownest parts. True length very doubtful.
1616.6	1618.2	Siltstone and oil shale: medium to light gray siltstone (N 5.0-6.0; some very slight brown to olive tint) and medium to dark olive gray and brownish gray oil shale (5Y & 2.5Y 4/1-3/1; some almost neutral). Tight massive siltstone; very faint smooth streaked bedding and some laminae in oil shale. Very irregular mixed up core pieces; true length very doubtful. <div style="margin-left: 40px;">Sample of siltstone from 1617.1 feet:  X-ray - albite, quartz, sanidine, dolomite, pyrite, nahcolite.</div>
1618.2	1621.1	Missing.
1621.1	1622.0	Oil shale: medium to dark olive gray and brownish gray (5Y & 2.5Y 4/1-3/1). Very faint smooth laminae and streaked bedding. Very regular to some irregular, thin to thick parting; fairly smooth to irregular and conchoidal fracture. Rare very fine flat cavities with buff earthy fillings. Rare fine fairly dense tan laminae in lower part. <div style="margin-left: 40px;">Sample of olive gray oil shale from 1621.9 feet:  X-ray - feldspar, dolomite, quartz, pyrite, illite, siderite?</div>
1622.0	1623.4	Oil shale: medium to rare light brownish gray (2.5Y & 10YR 5/1-5/2, some 4/2, rare 6/1) and rare medium to dark olive gray (5Y 4/1-3/1). Very faint smooth bedding and rare laminae. Very irregular mixed up core pieces. Common very fine buff blebs and streaks; some very fine cavities with very rare white crystalline calcite (?) fillings. True length very doubtful.
1623.4	1623.9	Oil shale: medium to dark brownish gray and olive gray (2.5Y & 5Y 4/1-3/1, some 2.5Y 4/2-5/2 upper part). Very faint smooth laminae and streaked bedding. Regular to some irregular, medium to rare thin parting; slightly conchoidal to irregular fracture. Common fine buff earthy porous streaks.

## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1623.9	1629.3	Missing.
1629.3	1632.2	Oil shale: medium to dark olive gray and brownish gray (5Y & 2.5Y 4/1-3/1). Very faint smooth bedding and some laminae. Very regular to some irregular, thick to medium parting; conchoidal fracture. Very rare very fine tan dense to silty laminae. A fine vitreous black brittle organic crust on parting surface at 1630.5 feet. Some very fine dense buff to white streaks near base. Commonly broken up and mixed up; true length doubtful.
1632.2	1634.4	Missing.
1634.4	1635.0	Oil shale: medium to light and rare dark olive gray (5Y 4/2-6/2, rare 3/1). Very faint smooth bedding and rare laminae. Very regular thick to medium parting; slightly irregular and conchoidal fracture. Common very fine buff earthy blebs and very fine cavities partly to completely filled with white crystalline calcite. <div style="margin-left: 40px;"> <p>Sample of medium to dark olive gray oil shale with common fine calcite-filled cavities from 1634.5 feet:</p> <p>X-ray - calcite, feldspar, dolomite, quartz, pyrite, illite.</p> </div>
1635.0	1637.2	Oil shale and marlstone (?): light to medium brownish gray and olive gray (2.5Y & 5Y 6/1-4/2, rare 2.5Y 6/2-5/2; commonly almost neutral gray in lower part). Very faint smooth bedding and rare faint to moderately distinct laminae. Very irregular mixed up core pieces. Rare pieces with common very fine buff earthy blebs and streaks in upper part. True length very doubtful.
1637.2	1647.6	Missing.
1647.6	1648.2	Oil shale: dark to rare medium brownish gray (2.5Y 3/1, rare 4/1). Very faint smooth bedding and rare laminae. Very regular medium to thin parting; slightly conchoidal fracture. Some very fine disseminated crystals in upper part. A single unrelated thin piece of medium brown shale with common fine yellowish buff earthy porous blebs in middle.
1648.2	1650.2	Oil shale: dark to medium brownish gray (2.5Y 3/1-5/1). Very faint smooth laminae. Very irregular mixed up core pieces. Dense to silty gray tuff (?) with common very fine dark oil-shale streaks and stringers in upper part; several vertical fractures with dark reddish brown coatings extend through tuff. True length very doubtful.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1650.2	1651.2	Oil shale: medium to dark olive gray (5Y 4/1-3/1; almost neutral) with interbedded medium brown to dark brownish gray (2.5Y & 10YR 5/3-4/3 & 3/2). Fairly distinct to very faint smooth laminae. Very irregular mixed up core pieces; true length doubtful. Sample of interlaminated gray and brown oil shale from 1650.8 feet: X-ray - feldspar, dolomite, pyrite, <u>analcite</u> .
1651.2	1654.1	Missing.
1654.1	1655.5	Oil shale: dark to medium olive gray (5Y 3/1-4/1; almost neutral) and dark to medium brownish gray (2.5Y 3/1-4/1, some 10YR 4/2-5/2). Very faint smooth streaked bedding and some laminae. Regular to some very irregular, thick to medium parting; irregular fracture. Very common very fine white to buff, crystalline to earthy blebs. Tan to buff marlstone in lower 2 inches. Mostly irregular mixed up core pieces; true length doubtful. Sample of dark olive gray and brownish gray oil shale with common fine crystalline blebs from 1655.0 feet: X-ray - dolomite, feldspar, calcite, quartz.
1655.5	1665.3	Missing.
1665.3	1667.0	Oil shale: medium brownish gray (10YR & 2.5Y 5/2-5/1, rare 4/2) and neutral gray (N 5.0-4.0). Faint smooth laminae. Very smooth to some irregular, medium to thick parting; smooth to conchoidal and irregular fracture. Very irregular mixed up core pieces in lower part; true length doubtful.
1667.0	1667.5	Oil shale: dark to medium brownish gray and brown (10YR 3/2-4/2 & 4/3). Very faint smooth laminae and streaked bedding. Regular to irregular, thick to medium parting; irregular fracture. Some irregular mixed up core pieces; true length doubtful.
1667.5	1669.0	Missing.
1669.0	1670.6	Oil shale: medium to some dark brownish gray and brown (10YR 4/2 & 4/3, some 3/2-3/1, rare 5/3). Faint smooth laminae and some very faint streaked bedding. Regular to irregular, thick to medium parting; smooth to irregular and conchoidal fracture. Some very fine gray pyritic streaks.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1670.6	1671.3	Oil shale: dark to medium brownish gray (10YR 3/2 & 3/1-4/2). Faint smooth laminae and very faint streaked bedding. Regular to some irregular, thick to medium parting; irregular fracture. Rare dense brownish gray to tan laminae. An irregular high angle fracture with very fine gray-buff patchy crusts in upper part. Some very tight very short vertical fractures in tan laminae at 1671.2 feet.
1671.3	1674.1	Marlstone and mudstone: light brownish gray to buff (10YR & 2.5Y 6/2-7/2). Very faint smooth to very slightly distorted laminae and streaked bedding; some massive bands. Mostly badly broken up and mixed up core pieces; some very regular thick to thin parting. Common very fine dark specks (pyrite in part) in some pieces. Rare very fine gray pyritic streaks. True length very doubtful. <div style="margin-left: 40px;"> <div style="display: inline-block; vertical-align: middle;">[</div> <div style="display: inline-block; vertical-align: middle;">Sample of buff mudstone with common very fine pyrite from 1673.8 feet: X-ray - dolomite, feldspar, pyrite, quartz?</div> </div>
1674.1	1682.0	Missing.
1682.0	1684.0	Oil shale: medium to rare light and dark brownish gray (10YR 4/2-5/2, rare 3/2 upper part, rare 6/2 lower part). Very faint distorted to smooth streaked bedding and some massive. Very irregular mixed up core pieces. Some fine dense gray blebs and streaks and rare small irregular vugs in upper part. A very irregular 2-inch vuggy piece of buff marlstone at top; a thin piece of laminated shale at base. True length very doubtful. <div style="margin-left: 40px;"> <div style="display: inline-block; vertical-align: middle;">[</div> <div style="display: inline-block; vertical-align: middle;">Sample of oil shale with some fine dense gray blebs from 1682.7 feet: X-ray - feldspar, ferroan, dolomite, quartz.</div> </div>
1684.0	1689.1	Missing.
1689.1	1690.0	Oil shale: buff to medium brownish gray (10YR 7/2-4/2 & 4/1). Moderately distinct to very faint smooth laminae. Very badly broken up and mixed up core pieces. Common fine gray laminae. True length very doubtful.
1690.0	1690.6	Oil shale: light to medium brownish gray (10YR 6/1-4/2 & 4/1). Very faint to faint smooth laminae. Regular thick to thin parting; slightly conchoidal fracture.
1690.6	1691.5	Missing.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1691.5	1692.8	Oil shale: medium to very rare dark brownish gray and medium brown (2.5Y 4/2 & 4/1-5/2 & 5/1, some 10YR 4/2, rare 4/3 & 3/2). Faint smooth and rare slightly distorted laminae to very faint streaked bedding. Regular to irregular, thick and some medium parting; conchoidal to irregular fracture. Rare very fine pyrite streaks. Very rare very fine resinous to vitreous black organic streaks.
1692.8	1693.9	Oil shale: medium brownish gray and rare brown (10YR & 2.5Y 5/2-4/2, some 5/1-4/1, rare 5/3-4/3). Very faint to faint smooth laminae. Regular thick to some thin parting; slightly conchoidal to slightly irregular fracture. A smooth to slightly irregular vertical fracture with some resinous brown to black crusty patches extends through interval.
1693.9	1695.1	Oil shale: light to medium brownish gray, rare buff (10YR 6/1 & 6/2-4/1 & 4/2, rare 7/1-7/2). Faint to very faint smooth laminae. Badly broken up and mixed up; common regular medium to thin parting. Some vertical fracture surfaces with dark brown to black patchy crusts and rare pyrite. True length doubtful.
1695.1	1697.1	Oil shale: medium brownish gray (10YR & 2.5Y 5/1 & 5/2-4/1 & 4/2). Very faint smooth laminae and streaked bedding. Regular thick to some thin parting; slightly conchoidal to slightly irregular fracture. Common vertical fractures with vitreous black to dark brown organic crusts down to 1696.7 feet.
1697.1	1701.5	Missing.
1701.5	1703.2	Oil shale: medium to light brownish gray (10YR 4/1 & 4/2-6/2; some almost neutral gray). Very faint to faint smooth laminae and some streaked bedding. Regular medium to some thick and thin parting; slightly irregular and conchoidal to rare coarse hackly fracture.
		<div style="border-left: 1px solid black; padding-left: 10px;"> Sample of almost neutral gray shale with very regular thick parting from 1701.5 feet:  X-ray - feldspar, dolomite, pyrite, ferroan, dawsonite? </div>
1703.2	1704.6	Oil shale: light to medium brownish gray, some gray-buff in upper part (10YR 6/1 & 6/2-5/1 & 5/2, some 7/1 upper part). Faint smooth laminae to some slightly distorted streaks and stringers. Regular thick to thin parting; slightly irregular to irregular and rare hackly fracture. Parting surfaces are commonly very dark brownish gray to black and commonly have <u>very</u> fine pebbly texture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1704.6	1706.2	Oil shale: medium brownish gray (10YR 5/1-5/2). Very faint smooth laminae and streaked bedding. Regular to some irregular, thick to thin parting; irregular to slightly conchoidal fracture. Some dark very fine pebbly parting surfaces. Some irregular mixed up core pieces in upper part; true length doubtful.
1706.2	1707.3	Oil shale: medium to some dark brownish gray (10YR 4/1 & 4/2-3/1 & 3/2, rare 4/1-4/2 upper part). Very faint smooth laminae and streaked bedding. Mostly very irregular mixed up core pieces; true length very doubtful.
1707.3	1708.4	Missing.
1708.4	1711.8	Oil shale: medium to dark brownish gray and some brown (10YR 4/2-3/2, some 4/3, very rare 2/2). Faint fairly smooth to distorted streaked bedding and some laminae. Very irregular to very badly broken up and mixed up core pieces; true length very doubtful.
1711.8	1713.3	Missing.
1713.3	1715.1	Oil shale: medium to dark brownish gray (10YR & 2.5Y 4/2-3/2, rare 2/2). Faint to very faint smooth laminae and streaked bedding. Irregular mixed up core pieces in upper part; irregular to regular, thick to medium parting and very irregular to conchoidal fracture in lower part. A 1/2-inch yellowish buff earthy band at 1714.7 feet. True length very doubtful. [ Sample of thin buff earthy band from 1714.7 feet: X-ray - sanidine, albite, ferroan.
1715.1	1717.2	Oil shale: medium to light brownish gray (10YR & 2.5Y 5/2-6/2). Faint smooth laminae and streaked bedding. Regular to irregular, medium to thick parting; conchoidal to irregular fracture. Rare fine buff-white earthy streaks in middle part. Very irregular mixed up core pieces in lower part; true length doubtful.
1717.2	1729.2	Missing.
1729.2	1730.1	Oil shale: medium brownish gray and brown to some buff (10YR 4/2 & 4/3-6/2, some 7/2). Fractured to brecciated and crushed in upper part to very faint fairly smooth streaked bedding in lower part. Very irregular parting and fracture in upper part; regular to irregular, medium to thin parting and slightly irregular to very irregular fracture in lower part. Some fine buff earthy streaks, spots, and stringers. Some very fine pyrite in fractured parts. [ Sample of fractured to brecciated shale with some fine buff spots and very fine pyrite from 1729.3 feet: X-ray - dolomite, quartz, feldspar, pyrite, magnesite.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1730.1	1731.5	Oil shale: dark and rare medium brownish gray (10YR & 2.5Y 3/2, rare 4/2 & 2/2). Very faint slightly distorted to smooth streaked bedding; some very faint laminae in lower part. Irregular thick to medium parting; irregular fracture. Common very fine buff earthy porous streaks and blebs. Fairly common very fine disseminated crystals. Vuggy fractured parting surfaces at 1730.6 feet. Some tight irregular natural fractures in lower part--rarely with slightly bleached edges. <div style="margin-left: 40px;">[ Sample of oil shale with buff earthy blebs and some disseminated crystals from 1730.7 feet:  X-ray - quartz, dolomite, feldspar, pyrite, magnesite, illite.</div>
1731.5	1732.5	Oil shale: medium brownish gray (2.5Y 5/1 & 5/2-4/1 & 4/2; common slight olive tint). Faint smooth laminae. Fairly regular to irregular thick parting; irregular to slightly conchoidal fracture. Very common very fine white crystalline specks in some zones. Rare zones with common very fine cavities with dark brown bitumen fillings. Some irregular natural (?) high angle fractures.
1732.5	1735.7	Oil shale: light to medium brownish gray and olive gray (2.5Y & 5Y 6/1-4/1, some 5/2-4/2; commonly almost neutral gray). Faint smooth laminae to very faint bedding. Mostly very badly broken up and mixed up; true length very doubtful.
1735.7	1737.0	Missing. <span style="float: right;">Top nahcolite</span>
1737.0	1738.4	Oil shale: medium to some light brownish gray (2.5Y & 10YR 5/2-4/2, some 6/2). Very faint smooth streaked bedding and some laminae. Irregular to regular, thick to some thin parting; irregular fracture. Some very fine buff earthy to white crystalline blebs. Some 1- to 2-inch dense brown bands (dolomite and nahcolite?) from 1737.6 to 1738.1 feet. Some 1/4- to 1/2-inch coarsely crystalline nahcolite (?) blebs and nodes in lower part. <div style="margin-left: 40px;">[ Sample of dense massive brown band from 1737.7 feet:  X-ray - nahcolite, dolomite, some quartz.  Sample of oil shale with small nahcolite masses from 1738.3 feet:  X-ray - dolomite, nahcolite, quartz, feldspar, pyrite, calcite?</div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1738.4	1739.9	Oil shale: medium to light olive gray (5Y 6/2 & 6/1-5/1; some slight brown tint). Very faint smooth laminae and streaked bedding. Regular to some irregular, thick to medium parting; irregular fracture. Some fine gray pyritic crystalline streaks. Common very fine black acicular flecks near top. 1-inch and 3/4-inch white to transparent crystalline bands at 1739.1 and 1739.3 feet (partly dissolved). A thin dense brownish gray to brown band at 1739.5 feet (like 1737.7 feet). Some very fine tight vertical nahcolite-filled fractures in lower 0.3 foot. <div style="margin-left: 40px;">                     Sample of white crystalline band from 1739.1 feet:                      X-ray - nahcolite.                      Sample of medium to light olive gray oil shale with some very fine pyritic streaks from 1739.4 feet:                      X-ray - dolomite, quartz, feldspar, nahcolite?, pyrite, illite.                 </div>
1739.9	1740.4	Nahcolite: white with some brown to tan mottling. Massive, fine to moderately coarse crystalline. Some thin irregular dense brown bands (like 1737.7 feet). Rare thin to fine oil-shale stringers as above. Some fine irregular cavities with rare buff earthy fillings. <div style="margin-left: 40px;">                     Sample of white to brown mottled nahcolite with some fine cavities from 1740.1 feet:                      X-ray - nahcolite.                 </div>
1740.4	1741.1	Oil shale: medium to some light brownish gray (2.5Y 5/2-4/2, some 6/2). Very faint smooth streaked bedding and rare laminae. Regular thick to medium parting; irregular fracture. Common very fine buff earthy blebs and some very fine black acicular flecks in upper part. Some very thin to very fine pyritic crystalline laminae and streaks. Some very fine tight vertical nahcolite (?) filled fractures. <div style="margin-left: 40px;">                     Sample of oil shale with some very fine buff blebs, black flecks and nahcolite-filled fractures from 1740.7 feet:                      X-ray - dolomite, quartz, feldspar, illite.                 </div>
1741.1	1742.2	Oil shale and nahcolite: medium to light brownish gray and olive gray oil shale (2.5Y & 5Y 5/2-6/2, some 4/2). Faint smooth to slightly distorted streaked bedding and some laminae. Some 1/2- to 1-1/4 inch white nahcolite bands. Regular to irregular, thick to medium parting; irregular fracture. Some nahcolite in fine stringers, streaks and blebs. Some very fine tight nahcolite-filled fractures. Rare very fine black acicular flecks.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1742.2	1744.8	<p>Nahcolite and oil shale: white to brown nahcolite and medium to rare light brownish gray oil shale (2.5Y &amp; 5Y, some 6/2 &amp; 4/2). Thick mottled to irregularly banded nahcolite bands at 1742.2-1742.6, 1742.9-1743.7, and 1744.3-1744.7 feet; some 1/2- to 1-1/4-inch bands from 1743.7 to 1744.3 feet. Very faint smooth to slightly distorted streaked bedding and rare laminae in oil shale. Some fine distorted oil shale stringers in thick nahcolite bands. Some fine to very small irregular cavities in nahcolite--some with coarse projecting crystals and commonly with some buff earthy fillings. Common very fine disseminated crystals in oil shale in lower part; rare fine pyritic crystalline streaks in other parts. White nahcolite is fine to coarse crystalline; brown nahcolite is dense and massive.</p> <p>[ Sample of white nahcolite with some fine to small cavities with rare muddy fillings from 1742.5 feet: X-ray - nahcolite.</p> <p>[ Sample of dense brown band from top of thick nahcolite zone from 1742.9-1743.0 feet: X-ray - nahcolite.</p> <p>[ Sample of white nahcolite with some fine cavities from 1743.6-1743.7 feet: X-ray - nahcolite.</p> <p>[ Sample of thin coarsely crystalline nahcolite band with some oil shale from 1743.8 feet: X-ray - nahcolite; some quartz, dolomite, feldspar, pyrite.</p> <p>[ Sample of nahcolite with some oil shale from top of thick zone from 1744.3 feet: X-ray - nahcolite; some quartz, dolomite, feldspar.</p> <p>[ Sample of dense to fine crystalline, brown to white nahcolite from 1744.4 feet: X-ray - nahcolite.</p> <p>[ Sample of white medium grained nahcolite from 1744.5 feet: X-ray - nahcolite.</p>
1744.8	1746.1	<p>Oil shale: medium to light brownish gray and olive gray, very rare medium brown in lower part (2.5Y &amp; 5Y 5/2-6/2, very rare 2.5Y 4/3). Very faint smooth to slightly distorted streaked bedding and rare laminae. Regular thick to medium parting; slightly irregular to irregular fracture. Common fine disseminated nahcolite and some very small blebs. Common very fine buff earth streaks, blebs, and rare laminae.</p>

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		<p>Sample of oil shale with disseminated nahcolite and buff earthy blebs from 1745.6 feet: X-ray - dolomite, quartz, feldspar, pyrite, nahcolite, illite.</p>
1746.1	1748.0	<p>Nahcolite and oil shale: white to brown nahcolite and medium to light and rare dark olive gray and brownish gray oil shale (5Y &amp; 2.5Y 5/2-6/2, rare 5Y 3/1). Thick irregularly banded nahcolite bands at 1746.1-1746.5 and 1746.9-1747.9 feet. Faint smooth laminae and streaked bedding in oil shale with some fine nahcolite laminae and very fine nahcolite-filled fractures. Rare fine oil-shale stringers in nahcolite. Some fine cavities in nahcolite. White nahcolite is fairly coarse crystalline; brown nahcolite dense.</p> <p>Sample of brown dense to very fine grained nahcolite from 1746.9 feet: X-ray - nahcolite.</p> <p>Sample of very pale brown medium grained nahcolite from 1747.0 feet: X-ray - nahcolite.</p> <p>Sample of light to medium brown, dense to fine grained nahcolite from 1747.4 feet: X-ray - nahcolite.</p> <p>Sample of white to transparent nahcolite at base of thick band from 1747.9 feet: X-ray - nahcolite.</p>
1749.0	1750.0	<p>Nahcolite: medium brownish gray and brown to some white. Faintly mottled to irregularly banded; very fine to moderately coarse crystalline. Rare fine to thin oil-shale stringers. Some fine cavities.</p> <p>Sample of medium to pale brownish gray and translucent nahcolite with fine oil-shale stringers from 1749.0 feet: X-ray - nahcolite, trace quartz.</p>
1750.0	1751.0	<p>Oil shale and nahcolite: medium to light brownish gray and olive gray oil shale (2.5Y &amp; 5Y 5/2-6/2, rare 2.5Y 4/3). Very faint fairly smooth bedding to faint very distorted and fractured laminae; streaks, and stringers. Very irregular parting and fracture. Very common fine disseminated nahcolite and some buff earthy streaks in upper part, common very irregular fine to thick nahcolite stringers and fine fracture fillings in lower part.</p>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1751.0	1752.1	Oil shale and some nahcolite: light to medium brownish gray and olive gray, some buff (2.5Y & 5Y 6/2-5/2, some 7/2). Faint fairly smooth to distorted streaked bedding and some laminae. Regular to some irregular and wavy, thick to medium parting; slightly irregular to irregular fracture. Common very fine disseminated nahcolite with associated buff earthy blebs and streaks; some fine to small dark brownish gray nahcolite blebs and thin stringers and laminae. A 0.1-foot band of dense brown nahcolite at 1751.7 feet. An irregular 0.1-foot white to slightly brown nahcolite band at 1751.9 feet. <div style="margin-left: 40px;">                     { Sample of brown dense to very fine crystalline nahcolite from 1751.7 feet:                      X-ray - nahcolite.                      Sample of light to medium olive gray and brownish gray oil shale with some fine pyritic (?) streaks from 1751.8 feet:                      { X-ray - dolomite, quartz, feldspar, nahcolite, pyrite, illite.                 </div>
1752.1	1753.9	Nahcolite: white and dirty yellow to medium brownish gray. Irregularly banded to mottled; coarse to very fine crystalline. Some fine distorted oil-shale stringers. Fairly common fine irregular cavities--especially in coarser, whiter parts. <div style="margin-left: 40px;">                     { Sample of moderately coarse nahcolite with very small cavities from 1753.4 feet:                      X-ray nahcolite, trace halite??                 </div>
1753.9	1756.9	Nahcolite and oil shale: medium brownish gray to some white nahcolite and very light yellowish buff to medium olive gray and brownish gray oil shale (5Y & 2.5Y 8/3-5/2). Very thick to thin, massive to mottled nahcolite bands and stringers with 2 inch wavy bands to fine distorted and broken stringers of oil shale. Common fine cavities. Very white nahcolite in lower 0.3 foot. <div style="margin-left: 40px;">                     { Sample of thin sparry nahcolite (?) band with some marlstone from 1754.2 feet:                      X-ray - nahcolite, dolomite, quarta, feldspar, pyrite, illite.                      Sample of very white nahcolite with some very fine cavities from 1756.8 feet:                      X-ray - nahcolite.                 </div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1756.9	1757.9	Oil shale and nahcolite: medium to light brownish gray oil shale (2.5Y 5/2-6/2, rare 4/2) and medium brownish gray to rare white nahcolite. Faint smooth to slightly distorted laminae and streaked bedding in oil shale. Thin to thick irregular massive bands of fine to rare moderately coarse grained nahcolite. Regular thick to medium parting; irregular fracture. Some very fine pyrite blebs. [ Sample of massive fine grained brownish gray nahcolite band from 1757.6 feet: X-ray - nahcolite, trace quartz.
1757.9	1759.1	Oil shale and nahcolite: medium to very rare dark brownish gray oil shale (2.5Y & 10YR 5/2, rare 4/2-3/2) and dark to pale brownish gray nahcolite. Very faint smooth to distorted streaked bedding in oil shale. Common fine to 3/4-inch nahcolite blebs--some with radiating crystals. Irregular parting and fracture. Common very fine buff specks in some parts. [ Sample of medium brownish gray oil shale with very fine buff specks from 1758.3 feet: X-ray - dolomite, quartz, feldspar.
1759.1	1760.1	Oil shale and nahcolite: medium brownish gray oil shale (2.5Y 5/2, rare 4/2). Very faint distorted to smooth streaked bedding in oil shale. Common fine dark nahcolite blebs and some thick fine grained bands. Irregular to some regular, thick to thin parting; irregular fracture. A 1/4-inch nahcolite-filled fracture at 1759.8-1760.0 feet. [ Sample of nahcolite fracture filling from 1759.9 feet: X-ray - nahcolite, trace halite??
1760.1	1763.1	Nahcolite and rare oil shale: white to brownish gray nahcolite and medium to light brownish gray oil shale (2.5Y 5/2-6/2). Mottled, medium to coarse grained nahcolite with some fine distorted oil-shale stringers; thick oil shale zones with some nahcolite stringers and blebs at 1761.1-1761.4 and 1762.9-1763.1 feet. Some very small cavities. Irregular parting fracture.
1763.1	1764.7	Nahcolite: white to medium brown and brownish gray. Moderately coarse to very fine grained, mottled to massive nahcolite; very rare fine distorted oil-shale stringers. Irregular parting and fracture. [ Sample of mottled white to brown, coarse to fine grained nahcolite from 1763.2 feet: X-ray - nahcolite, trace halite??



# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMiner-AEC Colorado Corehole No. 1--Continued

From	To	Description
1764.7	1765.7	<p>Sample of massive fine grained brownish gray to brown nahcolite from 1764.5 feet: X-ray - nahcolite, trace halite??</p> <p>Oil shale and nahcolite: medium brownish gray and brown oil shale (10YR 5/2 &amp; 5/3-4/2 &amp; 4/3) and dark brownish gray to some pale yellow nahcolite. Very faint distorted streaked bedding in oil shale. Irregular parting and fracture. Common fine nahcolite blebs to 0.1-foot coarsely crystalline radiating masses; some very irregular massive fine grained stringers. Some vertical fractures with fine nahcolite crusts near top.</p>
1765.7	1766.7	<p>Nahcolite and some oil shale: medium brownish gray and brown nahcolite and some medium brownish gray oil shale (10YR 5/2-4/2). Massive, dense to very fine grained nahcolite. Irregular to some fairly regular thick parting; irregular and conchoidal to fairly smooth fracture. Some thick to thin, distorted to fairly smooth oil-shale stringers. Some small coarsely crystalline nahcolite blebs near base.</p>
1766.7	1767.8	<p>Sample of dense massive nahcolite from 1766.4 feet: X-ray - nahcolite, some magnesite.</p> <p>Oil shale and nahcolite: medium to dark brownish gray oil shale (10YR 4/2-3/2) and dark brownish gray nahcolite. Very faint distorted streaked bedding in oil shale. Common thin to thick stringers and nodules of massive fine grained nahcolite. Some moderately large coarsely crystalline radiating nahcolite masses near top. Section consists mostly of irregular mixed up core pieces; true length doubtful.</p>
1767.8	1770.2	<p>Oil shale and nahcolite: dark and rare medium brownish gray oil shale (10YR &amp; 2.5Y 3/2, rare 4/2-4/1) and dark brownish gray to black nahcolite. Very faint smooth to distorted streaked bedding in oil shale. Common thin to thick fine grained massive nahcolite stringers and nodules. Some very large coarsely crystalline nahcolite masses in lower part. Irregular thick parting; slightly irregular fracture.</p>
1770.2	1771.0	<p>Sample of dark brownish gray oil shale from 1768.7 feet: X-ray - dolomite, quartz, feldspar, pyrite, magnesite.</p> <p>Oil shale: dark to medium brownish gray (10YR &amp; 2.5Y 3/2-4/2, rare 2/2); rare satiny to resinous luster. Very faint wavy to smooth streaked bedding. Irregular thick parting; slightly irregular and conchoidal fracture. Very rare fine nahcolite (?) blebs.</p>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1771.0	1772.3	Oil shale: medium brownish gray (10YR & 2.5Y 4/2-5/2). Very faint smooth streaked bedding. Irregular to slightly irregular thick parting; fairly smooth fracture. Rare fine gray pyritic (?) streaks and blebs.
1772.3	1773.3	Oil shale and nahcolite: medium brownish gray oil shale (2.5Y 5/2-4/2) and dark brownish gray to some pale yellowish gray and rare colorless nahcolite. Very faint distorted streaked bedding and some laminae in oil shale. Common small to 3-inch coarsely crystalline nahcolite masses. Some fine nahcolite-filled vertical fractures. Common fine interstitial shale partings in nahcolite masses. Very irregular parting and fracture. <div style="border-left: 1px solid black; padding-left: 10px; margin-left: 20px;"> Sample of coarse nahcolite with fine oil shale partings from 1772.5 feet:  X-ray - nahcolite, quartz, dolomite, feldspar, pyrite. </div>
1773.3	1774.3	Oil shale and nahcolite: medium to some light brownish gray oil shale (2.5Y 5/2-4/2, some 6/2 lower part) and dark brownish gray to medium brown nahcolite. Very faint smooth to distorted and wavy laminae and streaked bedding in oil shale. Common thin to 1-inch stringers and bands of very fine grained nahcolite. Regular to wavy, thick to very thin parting; irregular fracture.
1774.3	1775.5	Oil shale and nahcolite: light to medium brownish gray oil shale (2.5Y 6/2-4/2) and dark to medium brownish gray nahcolite. Faint smooth to distorted and displaced laminae in oil shale. Common fine to thin laminae, stringers, and streaks of very fine grained to dense massive nahcolite. Wavy to irregular thick parting; slightly conchoidal to irregular fracture. Very common fine to moderately coarse disseminated nahcolite at 1775.0-1775.3 feet. <div style="border-left: 1px solid black; padding-left: 10px; margin-left: 20px;"> Sample of light to medium brownish gray oil shale with rare fine dense nahcolite (?) streaks from 1774.6 feet:  X-ray - quartz, dolomite, dawsonite, feldspar, ferroan, nahcolite, pyrite, illite. </div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1775.5	1777.0	Oil shale and nahcolite: medium to some light and rare dark brownish gray oil shale (2.5Y & 10YR 4/2-5/2, some 6/2, rare 3/2) and dark to medium brownish gray and rare brown nahcolite. Faint slightly wavy to distorted laminae in oil shale. Common thin to 1-inch fine to moderately coarse, nahcolite stringers and nodules. Regular and wavy to very irregular thick parting; slightly conchoidal to irregular fracture.
1777.0	1777.7	Nahcolite: medium brown to some dark brownish gray. Very fine grained, massive to very faintly banded. Some fine to thin distorted oil-shale stringers.
1777.7	1779.0	Oil shale and some nahcolite: medium and rare dark brownish gray oil shale (10YR 4/2, rare 3/2). Very faint smooth and some slightly distorted streaked bedding in oil shale. Common very thin to 3/4-inch fine grained nahcolite bands and stringers. Regular to irregular thick parting; fairly regular fracture. Rare small coarsely crystalline nahcolite blebs.
1779.0	1780.4	Oil shale: dark brownish gray (10YR 3/2). Very faint smooth to slightly distorted streaked bedding. Slightly irregular to irregular thick parting; slightly irregular fracture. Very rare small nahcolite masses.
1780.4	1781.6	Oil shale and nahcolite: dark brownish gray oil shale (10YR 3/2-2/2) and black to some pale yellowish gray nahcolite. Very faint smooth to distorted streaked bedding in oil shale. Some 2- to 3-inch coarsely crystalline nahcolite masses. Irregular thick parting; slightly irregular to irregular fracture.
1781.6	1784.6	Oil shale: dark brownish gray (10YR 3/2-2/2). Very faint slightly distorted to very smooth streaked bedding; Irregular thick parting; irregular to slightly conchoidal fracture. Some tight vertical fractures with vitreous to resinous black organic coatings in upper part. Resinous black hackly to platy fossil (?) fragments on parting surfaces at 1782.7 feet.
1784.6	1785.6	Oil shale and nahcolite: dark to some medium brownish gray oil shale (10YR 3/2, some 4/2) and dark brown to pale yellowish nahcolite. Very faint distorted streaked bedding in oil shale. Common small to very large irregular coarsely crystalline nahcolite masses with fine interstitial shale partings. Irregular thick parting; irregular to conchoidal fracture.
1785.6	1787.1	Oil shale: dark to some medium brownish gray (10YR 3/2, some 4/2 lower part, rare 2/2). Very faint smooth streaked bedding. Slightly irregular to irregular thick parting; fairly regular to some irregular fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1787.1	1788.1	Oil shale: medium brownish gray (10YR 5/2-4/2). Very faint smooth streaked bedding. Irregular thick to medium parting; irregular fracture. Some very fine dark gray streaks and laminae in middle part. <div style="margin-left: 40px;">                     Sample of oil shale with very fine dark gray laminae from 1787.4 feet:                      X-ray - quartz, dolomite, feldspar, dawsonite, ferroan, pyrite, illite.                 </div>
1788.1	1791.0	Oil shale: medium brownish gray (10YR 4/2, rare 5/2). Very faint smooth streaked bedding. Slightly irregular to irregular, thick to medium and rare thin parting; irregular to fairly regular fracture. A natural vertical fracture with rare very fine nahcolite (?) specks in upper part. Rare fine dark crystalline streaks and blebs near base. <div style="margin-left: 40px;">                     Sample of oil shale with rare very fine dark crystalline streaks and blebs from 1790.8 feet:                      X-ray - quartz, ferroan, feldspar, dolomite, pyrite.                 </div>
1791.0	1792.0	Oil shale: medium to dark brownish gray (10YR 4/2-3/2). Very faint smooth to slightly distorted streaked bedding. Irregular thick parting; fairly regular to irregular fracture. Some fine dark crystalline blebs.
1792.0	1795.0	Oil shale: dark brownish gray (10YR 3/2-2/2). Very faint smooth streaked bedding and some very fine laminae. Irregular to some fairly regular, thick to medium parting; slightly irregular and conchoidal to some very irregular fracture. Some fine brownish <u>black scaly fossil (?)</u> fragments at 1793.6 feet. Rare fine dense brownish gray pyritic laminae and stringers in lower part.
1795.0	1796.0	Oil shale: dark brownish gray and some dark brown (10YR 3/2, some 3/3). Very faint smooth to some distorted streaked bedding. Fairly regular to irregular thick parting; slightly conchoidal to irregular fracture. A large coarsely crystalline nahcolite mass at 1795.7 feet.
1796.0	1797.0	Oil shale: dark brownish gray and brown in upper part (10YR 3/2-3/3, rare 2/2), medium to light brownish gray in lower 0.2 foot (10YR 4/2-6/2); common satiny to resinous luster at 1796.6-1796.7 feet. Very faint smooth streaked bedding; some faint laminae in lower 0.2 foot. Irregular thick parting and slightly conchoidal fracture in upper part; fairly regular medium to thin parting in lower part. A very thin pinched out dark brownish gray silty-textured stringer near top.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of dark brownish gray oil shale with very thin silty-textured stringer from 1796.0 feet: X-ray - albite, quartz, ferroan, some dolomite ?
1797.0	1797.2	Missing.
1797.2	1798.2	Oil shale and nahcolite: medium brownish gray and brown oil shale (10YR 4/2-4/3, rare 5/2 near top) and dark brownish gray to some pale yellowish brown nahcolite. Massive to very faintly bedded oil shale. Thick bands of very fine grained nahcolite with very fine interstitial oil-shale (?) partings in upper 4 inches; common very small to 1-inch coarsely crystalline nahcolite blebs in lower part. Irregular thick parting; fairly regular to irregular fracture.
		Sample of very fine grained nahcolite from 1797.4 feet: X-ray - nahcolite, dolomite, quartz, feldspar.
1798.2	1799.4	Oil shale and nahcolite: medium to rare light brownish gray and tan oil shale (10YR 4/2-5/2, rare 6/2-6/3) and dark brownish gray to white nahcolite. Massive to very faintly bedded oil shale. Common fine to small coarsely crystalline nahcolite blebs; several fine to 1/4-inch vertical seams of white and pale brown to colorless nahcolite--commonly in fine prismatic to silky crystals normal to sides. Very irregular parting and fracture.
		Sample of nahcolite fracture filling from 1799.2 feet: X-ray - nahcolite, trace quartz.
1799.4	1800.0	Nahcolite: medium brown. Dense and massive. Conchoidal fracture. A 1/2-inch dark to medium brownish gray oil-shale band at 1799.6 feet. Fine ridges on outside of core indicate differential solution without apparent corresponding internal variation.
		Sample of ridged (less soluble) nahcolite from 1799.8 feet: X-ray - nahcolite; dolomite (about 30%).
		Sample of grooved (more soluble) nahcolite from 1799.9 feet: X-ray - nahcolite, dolomite (about 20%).

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1800.0	1801.2	Oil shale and nahcolite: medium brownish gray oil shale (10YR 4/2) and dark brownish gray to medium brown nahcolite. Very faint slightly distorted to smooth bedding in oil shale. Fairly common fine to small coarsely crystalline nahcolite blebs in upper part; dense to fine grained nahcolite with some fine shale stringers at 1800.7-1800.9 feet. Irregular to some fairly regular thick parting; irregular to slightly conchoidal fracture.
1801.2	1801.6	Tuff(?): buff to light brownish gray (10YR 7/2-6/2), dense to rare sparry texture. Faint distorted to contorted and overturned streaks. Irregular parting and fracture. Slightly irregular unconformable contacts at top and bottom. <div style="margin-left: 40px;">Sample of dense light brownish gray tuff from 1801.4 feet:  X-ray - albite, quartz, dolomite.</div>
1801.6	1802.2	Nahcolite and oil shale: medium brown to dark brownish gray nahcolite and medium to dark brownish gray oil shale (10YR 5/2-3/2). Dense to very fine grained nahcolite from 1801.7 to 1802.0 feet. Oil shale with very faint smooth to distorted streaked bedding and small fine grained nahcolite blebs in other parts.
1802.2	1803.2	Oil shale and some nahcolite: medium to rare dark brownish gray oil shale (10YR 4/2, rare 3/2) and dark brownish gray to medium brown nahcolite. Very faint fairly smooth bedding in oil shale. Very fine grained to dense nahcolite bands at 1802.6-1802.7 and 1803.0-1803.2 feet; rare small coarsely crystalline nahcolite blebs near top. Slightly irregular to irregular thick parting; irregular to conchoidal fracture.
1803.2	1804.3	Oil shale and some nahcolite: medium to dark brownish gray oil shale (10YR 4/2-3/2, rare 5/2 upper part) and medium brown to brownish gray nahcolite. Very faint fairly smooth streaked bedding in oil shale. A 1-inch very dense brown nahcolite band at 1803.5 feet; a 0.2-foot fine grained nahcolite band at base. Slightly irregular to irregular thick parting; fairly regular fracture. <div style="margin-left: 40px;">Sample of dense brown nahcolite band from 1803.5 feet:  X-ray - dolomite, nahcolite.</div>
1804.3	1806.5	Oil shale: medium to dark brownish gray (10YR 4/2-3/2). Very faint fairly smooth streaked bedding. Irregular to slightly irregular thick parting; slightly irregular fracture. Some fine brownish gray nahcolite (?) streaks and blebs.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of oil shale with fine nahcolite streaks and blebs from 1805.4 feet: X-ray - feldspar, quartz, dolomite, nahcolite, ferroan, dawsonite.
1806.5	1814.5	Oil shale: medium to some dark brownish gray (10YR 4/2, some 3/2). Very faint fairly smooth to some distorted streaked bedding. Slightly irregular to irregular thick parting; fairly regular to some irregular fracture. Some small dense to fine grained nahcolite blebs and streaks; several large irregular fine grained masses at 1810.7-1811.1 feet; a 3-inch coarsely crystalline radiating mass at 1812.4 feet.
1814.5	1816.2	Oil shale: dark brownish gray (10YR 3/2, some 2/2). Very faint smooth bedding and rare very fine laminae. Slightly irregular to irregular thick parting; irregular to slightly conchoidal fracture.
		Sample of dark brownish gray oil shale from 1815.2 feet: X-ray - sanidine, dolomite, pyrite, dawsonite.
1816.2	1817.2	Oil shale: dark brownish gray to medium brown (10YR 2/2-4/3); some satiny to resinous luster. Faint smooth to slightly distorted streaked bedding. Slightly irregular to irregular thick parting; slightly irregular fracture. Very abrupt change to leaner nahcolitic shale below.
1817.2	1818.2	Nahcolite and some oil shale: medium to dark brown and brownish gray nahcolite and medium to light brownish gray oil shale (10YR 4/2-6/2). Faintly bedded oil shale with common irregular patches and stringers of medium to fine grained nahcolite in upper 0.3 foot; dense to very fine grained nahcolite with rare fine oil shale stringers in lower part. Slightly irregular to irregular thick parting; irregular and conchoidal to fairly regular fracture.
1818.2	1820.0	Oil shale and some nahcolite: buff and tan to medium brownish gray oil shale (10YR 7/2 & 6/3-4/2). Very faint distorted to fairly smooth streaked bedding; some faint laminae in lower part. Some very fine grained nahcolite blebs and stringers in upper part; some small to 1-inch coarsely crystalline radiating nahcolite nodules in lower part. A fine vertical nahcolite-filled fracture from 1818.4 to 1818.8 feet. Sharp slightly irregular and possibly unconformable contact with darker shale below.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of light brownish gray and tan to buff laminated shale with one fine nahcolite lamina from 1819.3 feet: X-ray - dolomite, quartz, dawsonite, feldspar.
1820.0	1821.6	Oil shale and some nahcolite: medium brownish gray to rare brown oil shale (10YR 4/2, some 5/2, rare 5/3) and dark brownish gray to some pale yellowish brown nahcolite. Very faintly bedded to massive oil shale. Some small to 4-inch coarsely crystalline radiating nahcolite masses. Irregular thick parting; irregular to very conchoidal fracture.
1821.6	1823.3	Oil shale: medium to dark brownish gray and brown, rare tan to buff near base (10YR 4/2 & 4/3-3/2, rare 5/3-7/3). Very faint to faint, slightly distorted to very smooth streaked bedding and rare laminae. Irregular to some fairly regular thick parting; irregular to conchoidal fracture. A tight vertical fracture with dark brown resinous coatings at 1821.9-1822.1 feet. Rare thin fine grained nahcolite stringers near base.
1823.3	1825.3	Oil shale: dark to rare medium brownish gray and brown (10YR & 7.5YR 3/2, some 2/2, rare 4/2-4/3); some very slight satiny luster in upper part. Very faint smooth streaked bedding. Irregular to fairly regular thick parting; slightly conchoidal to fairly regular fracture. Rare fine pyritic nahcolite (?) blebs and stringers near base.
		Sample of very dark slightly satiny shale from 1823.5 feet: X-ray - dolomite, feldspar, quartz, pyrite, ferroan?
1825.3	1826.4	Oil shale and some nahcolite: light to medium brownish gray and brown, some tan and rare buff (10YR 6/2-5/2 & 5/3, some 4/3 & 6/3, rare 7/2). Very faint distorted to smooth streaked bedding in upper and lower parts; faint to fairly distinct smooth laminae in middle part. Common fine to 1-inch fine grained nahcolite stringers in upper part; some small coarsely crystalline blebs to very fine disseminated crystals in lower part. Irregular to slightly irregular thick parting; slightly conchoidal to irregular fracture.
		Sample of fine grained nahcolite stringer from 1825.7 feet: X-ray - quartz, nahcolite, dolomite, pyrite.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1826.4	1827.0	Nahcolite: medium brown and brownish gray. Dense to very fine grained, massive to faintly mottled. Irregular parting and fracture. (Footage adjustment-- interval is actually 0.9 foot thick.)
1827.0	1828.0	Oil shale and nahcolite: buff and light brownish gray to some medium brown oil shale (10YR 7/2-6/2, some 5/3) and medium brown to some dark brownish gray nahcolite. Faint smooth streaked bedding and rare laminae in oil shale. Dense brown nahcolite bands at 1827.4-1827.7 & 1827.8-1827.9 feet; some fine dark nahcolite blebs and streaks in other parts. Fairly regular thick parting in oil shale; slightly conchoidal fracture. Nahcolite band at 1827.4 feet is very badly eroded.
1828.0	1829.0	Oil shale and some nahcolite: buff and tan to medium brown and brownish gray oil shale (10YR 7/2 & 6/3-4/3 & 4/2). Fairly distinct to faint, smooth to some very distorted laminae in oil shale. Some fairly large coarse nahcolite masses in upper part; some thin dense nahcolite bands in lower part. Irregular to fairly regular thick parting; slightly conchoidal to irregular fracture. Nahcolite shows considerable erosion.
1829.0	1830.0	Oil shale and some nahcolite: medium brown oil shale (10YR 5/3-4/3). Very faint slightly distorted to smooth streaked bedding. Some fine nahcolite blebs to 1-inch coarsely crystalline masses--rarely radiating. Irregular to fairly regular thick parting; slightly irregular to irregular fracture.
1830.0	1831.0	Oil shale and nahcolite: medium to light brownish gray and rare tan to buff oil shale (10YR 5/2-6/2, some 4/2 upper part, rare 6/3-7/2) and medium brown to brownish gray nahcolite. Faint to moderately distinct smooth laminae and some very faint streaked bedding in oil shale. Dense to very fine grained nahcolite from 1830.2 to 1830.6 feet; some thin fine grained nahcolite laminae, streaks, and blebs in other parts. Fairly regular to some irregular thick parting; slightly irregular fracture. Thick nahcolite band is strongly but irregularly eroded. <div style="margin-left: 40px;"> Sample of dense brown eroded nahcolite from  1830.5 feet:  X-ray - nahcolite, dolomite; some quartz, halite?? </div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1831.0	1835.8	Oil shale and some nahcolite: medium brownish gray and brown oil shale (10YR 4/2-4/3). Very faint distorted streaked bedding. Slightly irregular to irregular thick parting; irregular to slightly irregular fracture. Common fine blebs to irregular 2-inch stringers of dense to fine and some coarse crystalline nahcolite. Distinctly laminated brownish gray to buff oil shale with common very thin to 1-inch nahcolite bands in upper 0.4 foot.
1835.8	1836.5	Nahcolite: medium brown and rare dark brownish gray. Very fine grained to dense, massive to some <u>very</u> faint very contorted bedding (?). Some thin to fine interfingering oil shale stringers at top; sharp wavy contact at base. Irregular parting and fracture. Some parts very strongly and very irregularly eroded.
1836.5	1837.6	Oil shale: medium to dark brownish gray and brown (10YR & 7.5YR 4/2 & 4/3-3/2, rare 2/2 lower part). Very faint smooth to slightly distorted streaked bedding. Slightly irregular to irregular thick parting; slightly irregular to irregular and conchoidal fracture. Common very fine disseminated crystals and some fine to small crystalline blebs in upper part. Rare fine dark gray pyritic (?) crystalline stringers in lower part. <div style="margin-left: 40px;">Sample of oil shale with very fine disseminated crystals and rare fine crystalline blebs from 1836.8 feet:</div>
1837.6	1839.0	X-ray - dolomite, quartz, feldspar, dawsonite. Oil shale and nahcolite: dark to medium brownish gray oil shale (10YR 3/2-4/2) and dark brown to some pale yellow nahcolite. Very faint smooth to distorted streaked bedding. Irregular to rare regular thick parting; slightly conchoidal to irregular fracture. A 3-inch coarsely crystalline radiating nahcolite mass at 1838.9 feet; zones of irregular tightly clustered coarse nahcolite blebs at 1839.3-1839.4 and 1839.6-1839.9 feet. Nahcolite shows moderate to strong erosion.
1839.0	1840.0	Oil shale: medium brownish gray and brown to rare tan (10YR 4/2-5/3, rare 6/3). Faint to moderately distinct fairly smooth laminae and some very faint streaked bedding; common very fine loop structures and displacements. Irregular to slightly irregular thick parting; irregular to slightly conchoidal fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1840.0	1841.1	Oil shale and some nahcolite: medium and rare dark brownish gray to tan oil shale (10YR 4/2-6/3, rare 3/2). Distinct wavy laminae to faint fairly smooth streaked bedding; common fine loop structures and displacements. Irregular to fairly regular thick parting; slightly irregular to irregular fracture. 2- and 3-inch coarsely crystalline nahcolite masses at 1840.2 and 1840.5 feet. <div style="margin-left: 40px;">Sample of laminated oil shale from 1840.3 feet: X-ray - quartz, dolomite, feldspar, dawsonite.</div>
1841.1	1842.1	Oil shale: medium to some dark brownish gray (10YR 4/2, some 3/2). Very faint smooth streaked bedding. Irregular to fairly regular thick parting; slightly conchoidal fracture.
1842.1	1848.2	Oil shale: dark to some medium brownish gray (10YR 3/2, some 4/2). Very faint smooth to rare distorted streaked bedding. Slightly irregular to irregular thick parting; fairly regular to some irregular fracture. Some <u>very</u> fine disseminated crystals. Common very irregular fine grained nahcolite stringers and masses at 1846.2-1846.7 feet; rare fine streaks to 1-inch stringers and nodules in other parts. Very rare fine resinous black streaks (fossil fragments?). <div style="margin-left: 40px;">Sample of oil shale with some very fine disseminated crystals from 1845.7 feet: X-ray - dolomite, quartz, feldspar, dawsonite, pyrite.</div>
1848.2	1849.3	Nahcolite: medium brown and brownish gray. Very fine grained with rare coarse patches and stringers. Rare fine oil-shale stringers. Sample includes some shale at top and bottom.
1849.3	1849.7	Oil shale: dark brownish gray (10YR 3/2). Very faint smooth to slightly distorted streaked bedding. Rare small nahcolite blebs.
1849.7	1851.4	Nahcolite: brownish black to pale grayish yellow and rare colorless. Very coarsely crystalline with common very fine irregular to radiating interstitial shale partings. Very irregular parting and fracture. A 1/2- to 3/4-inch oil-shale stringer at 1850.3 feet. Sample includes some oil shale at top and bottom. <div style="margin-left: 40px;">Sample of very coarse nahcolite from 1849.8 feet: X-ray - nahcolite; some quartz, feldspar?</div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1851.4	1852.5	Oil shale: dark brownish gray to medium brown (10YR 3/2-4/3, rare 5/3 lower part). Very faint to faint, smooth to very slightly distorted streaked bedding. Irregular thick parting; irregular to fairly regular fracture. Rare small dark silty-textured pyritic blebs.
1852.5	1855.9	Oil shale: dark brownish gray, rare medium brown in lower part (10YR 3/2, rare 2/2 & 4/3); rare satiny luster. Very faint smooth streaked bedding; some very fine laminae in lower part. Irregular thick parting; slightly irregular and conchoidal fracture.
1855.9	1857.1	Oil shale: dark to rare medium brownish gray (10YR 3/2, rare 4/2); rare satiny luster. Very faint smooth streaked bedding and some very fine laminae. Irregular to fairly regular thick parting; slightly irregular to some coarse hackly fracture.
1857.1	1858.1	Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Very faint smooth to some distorted streaked bedding. Irregular thick parting; slightly irregular to irregular and some slight hackly fracture. Some fine brown to tan streaks in middle part. A very irregular 3-inch brown to light brownish gray blebby stringer with very common very fine disseminated pyrite at 1857.8 feet; some very fine vertical nahcolite-filled fractures. <div style="margin-left: 20px;"> Sample of thick brown stringer with common pyrite from 1857.9 feet:  X-ray - albite, quartz, pyrite. </div>
1858.1	1859.6	Oil shale: medium brownish gray and brown (10YR 4/2-4/3, rare 5/3). Very faint slightly distorted to smooth streaked bedding. Irregular to some fairly regular, thick to medium parting; fairly regular to irregular fracture. Rare short tight vertical fractures with dark brown resinous coatings. Some irregular brown to tan blebby masses and stringers and very small gritty blebs near base; common orange-brown to pale yellow stains on outside of core.
1859.6	1862.3	Oil shale: dark brownish gray (10YR 3/2). Very faint smooth streaked bedding. Irregular to slightly irregular thick parting; smooth to slightly conchoidal fracture. Very rare fine resinous to waxy black streaks (fossil fragments?). Some fine to small gritty black blebs near top--some with brown blebby centers.

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Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1862.3	1863.3	Oil shale and nahcolite; dark brownish gray oil shale (10YR 3/2) and brownish black to pale yellow and rare colorless nahcolite. Very faint distorted to some smooth streaked bedding in oil shale. Irregular 2- to 4-inch very coarsely crystalline nahcolite masses with common interstitial oil shale. Irregular parting and fracture.
1863.3	1866.0	Oil shale: dark to rare medium brownish gray (10YR 3/2, rare 4/2). Very faint smooth to very slightly distorted streaked bedding. Slightly irregular to irregular thick parting; fairly smooth to slightly irregular and conchoidal fracture. Rare thin to fine, gray to black pyritic stringers and small blebs. One small dark fine grained nahcolite nodule with pyritic rims at 1863.5 feet.
		Sample of oil shale with thin pyritic stringer from 1864.8 feet:
1866.0	1867.0	X-ray - pyrite; trace quartz, feldspar, dolomite. Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Very faint smooth streaked bedding. Irregular thick parting; irregular fracture. Very rare small gray to black pyritic blebs.
1867.0	1868.0	Oil shale: dark brownish gray (10YR & 7.5YR 3/2, rare 2/2 lower part). Very faint smooth streaked bedding. Slightly irregular to irregular thick parting; conchoidal to slightly irregular fracture. A 1- x 1-3/4-inch gray to black nodule with dense brown nahcolite (?) center at 1867.2 feet. A 0.1-foot zone of common fine lacy black stringers with some nahcolite at 1867.5 feet.
1868.0	1870.0	Oil shale: dark brownish gray (10YR 3/2-2/2, some 7.5YR 3/2 upper part). Very faint smooth streaked bedding and some very fine laminae. Irregular to some regular thick parting; slightly conchoidal and irregular fracture. Rare very fine silty-textured pyrite (?) streaks.
1870.0	1872.0	Oil shale: dark brownish gray to some black (10YR 3/2-2/2, some 1/2); some very slight satiny luster. Very faint smooth streaked bedding. Irregular thick parting; smooth to irregular and conchoidal fracture. A thin pinched out brownish gray silty-textured stringer at 1870.7 feet. Rare very fine resinous to vitreous black streaks in lower part (fossils?). (0.4 foot of core was apparently removed from lower part after core was boxed).

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1872.0	1873.0	Oil shale: dark brownish gray (10YR 3/2-2/2). Very faint very smooth laminae and streaked bedding. Regular to some irregular thick parting; conchoidal to fairly smooth fracture. Very rare very fine pyrite streaks.
1873.0	1874.2	Oil shale: dark to some medium brownish gray (10YR 3/2-2/2, some 4/2). Very faint very smooth streaked bedding and some faint laminae. Regular to some irregular thick parting; irregular to slightly conchoidal fracture. Fine brown to brownish gray slightly earthy to silty tuff (?) laminae at 1873.2 and 1873.5 feet. A fine crystalline stringer at 1873.8 feet. ( Sample of oil shale with fine crystalline stringer from 1873.8 feet: X-ray - quartz, dolomite, feldspar, dawsonite.
1874.2	1875.3	Oil shale: medium to dark brownish gray (10YR & 7.5YR 4/2-3/2, some 2/2 lower part). Very faint smooth to some very distorted streaked bedding and rare laminae. Slightly irregular to irregular thick parting; slightly conchoidal to some irregular fracture. Common fine dark brownish gray to black pyritic nahcolite blebs and stringers from 1874.4 to 1874.7 feet; common orangish brown stains on outside of core and on sawed surfaces.
1875.3	1876.1	Nahcolite: brownish black to pale yellowish brown and some colorless. Very coarse crystalline with some colorless transparent crystals up to 3/4-inch; common very fine interstitial oil-shale partings in darker parts. Sample includes some oil shale at top.
1876.1	1878.4	Oil shale and nahcolite: medium brownish gray oil shale (10YR 4/2-5/2) and brownish black to some pale yellowish brown nahcolite. Very faint distorted to some smooth streaked bedding in oil shale. Common small to 3-inch coarsely crystalline nahcolite masses; some very irregular fine grained nahcolite masses in upper part. Irregular thick to medium parting; very irregular fracture. Some vertical fractures with black to brown resinous coatings in lower part.
1878.4	1880.6	Oil shale and nahcolite: medium brownish gray oil shale (10YR 5/2-4/2) and dark brownish gray to medium brown nahcolite. Very faint distorted to fairly smooth streaked bedding in oil shale. Common very thin to 2-inch stringers and bands of very fine to dense crystalline nahcolite; rare small to 2-inch coarse nahcolite nodules in upper part. Irregular to some

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		fairly regular, thick to medium parting; irregular to fairly regular and some coarse hackly fracture. Some short tight vertical fractures with dark brown resinous coatings in upper part. Some nahcolite stringers and nodules have black pyritic rims, streaks, and patches.
		( Sample of oil shale with thin nahcolite stringers from 1878.6 feet: X-ray - dolomite, quartz, nahcolite, dawsonite, feldspar, pyrite.
1880.6	1882.3	Oil shale and nahcolite: medium to dark brownish gray oil shale (10YR 4/2-3/2, some 5/2 upper part) and brownish black to some pale brown nahcolite. Very faint distorted to some smooth streaked bedding and rare laminae in oil shale. Some fine blebs to 2-1/2-inch nodules of coarsely crystalline nahcolite. Slightly irregular to irregular, thick to medium and rare thin parting; irregular fracture. A very fine dense medium gray laminae at 1880.9 feet.
1882.3	1883.5	Oil shale and nahcolite: medium to rare light brownish gray oil shale (10YR 4/2-5/2, rare 6/2 lower part) and dark gray to medium brownish gray and rare brown nahcolite. Very faint slightly distorted streaked bedding in oil shale. Fairly common thin, fine crystalline to rare dense nahcolite stringers; a 3-inch nahcolite band at 1883.2 feet. Irregular thick parting; irregular to slightly irregular fracture.
1883.5	1884.4	Oil shale and some nahcolite: dark to some medium brownish gray oil shale (10YR 3/2, some 4/2) and brownish black to some pale grayish yellow nahcolite. Very faint distorted streaked bedding in oil shale. Common fairly coarse disseminated nahcolite crystals and very small blebs at 1883.8-1884.0 and 1884.3-1884.4 feet; rare fine blebs to small radiating nodules in other parts. Slightly irregular to irregular thick parting; slightly irregular to irregular fracture.
1884.4	1884.8	Missing (Core was apparently removed from box).
1884.8	1887.2	Oil shale and some nahcolite: dark to some medium brownish gray oil shale (10YR 3/2, some 4/2 lower part). Very faint fairly smooth to distorted streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Common small to large, very fine to medium grained nahcolite masses at 1886.7-1887.0 feet; rare very small to 1-inch masses in other parts.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1887.2	1888.0	Oil shale and nahcolite: medium to some light brown and brownish gray oil shale (10YR 5/3-4/2, some 6/2-6/3) and medium to dark brownish gray nahcolite. Fairly distinct very distorted streaks and stringers in oil shale. Very common thin to thick stringers and nodules of fine to medium grained nahcolite. Irregular parting and fracture. (Footage adjustment-- interval is actually 1.2 feet thick).
1888.0	1889.0	Oil shale: medium brownish gray and some brown to tan (10YR 4/2, some 5/3-6/3 upper part). Very faintly bedded medium brownish gray oil shale in upper 0.2 foot with thin brown to tan inclusions with irregularly oriented internal laminae; distinct slightly distorted and commonly displaced to smooth laminae from 1888.2 to 1888.6 feet; very faint smooth to some distorted streaked bedding in lower part. Irregular thick parting; irregular to slightly conchoidal fracture. A small coarsely crystalline radiating nahcolite nodule at 1888.1 feet; very thin fine grained stringers at 1888.4 and 1888.5 feet; a 1-1/2-inch coarse radiating nodule at 1888.7 feet.
1889.0	1891.0	Oil shale and some nahcolite: dark to rare medium brownish gray oil shale (10YR 3/2, rare 4/2) and brownish black to rare pale brown nahcolite. Very faint smooth to some distorted streaked bedding in oil shale. Some small to 2-inch coarsely crystalline radiating nahcolite masses. Irregular to some fairly regular thick parting; regular to some irregular and conchoidal fracture.
1891.0	1892.2	Oil shale and nahcolite: dark to rare medium brownish gray oil shale (10YR & 7.5YR 3/2, rare 4/2) and brownish black to some pale brown and rare colorless nahcolite. Very faint smooth to very distorted streaked bedding in oil shale. Common large irregular coarsely crystalline nahcolite masses from 1891.5 to 1892.2 feet. Irregular thick parting; slightly conchoidal to irregular fracture.
1892.2	1893.3	Oil shale: medium brownish gray and rare brown to tan (10YR 4/2, some 5/2, rare 5/3-6/3). Very faint fairly smooth to distorted streaked bedding and rare moderately distinct laminae. Irregular thick parting; irregular to conchoidal fracture. A very tight fracture with black resinous coatings in upper 0.4 foot. A thin fine grained nahcolite stringer at 1892.7 feet. A 2-inch coarse radiating nahcolite nodule at 1893.1 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1893.3	1894.3	Oil shale and nahcolite: medium to rare dark brownish gray and brown oil shale (10YR 4/2-4/3, rare 5/3 & 3/2; 2/2) and medium to dark brownish gray nahcolite. Very faint distorted streaked bedding and rare moderately distinct laminae in oil shale. Common thin to thick irregular fine grained nahcolite stringers. Irregular to rare regular thick parting; irregular fracture.
1894.3	1895.4	Oil shale: medium brownish gray and brown (10YR 4/2-4/3, rare 5/3). Faint to very faint, slightly distorted to smooth laminae and some streaked bedding. Slightly irregular to irregular, thick to medium parting; slightly conchoidal to some slight hackly fracture. A 1-inch coarse radiating nahcolite nodule near top; a very irregular 1-inch fine grained nahcolite stringer near base.
		Sample of very faint laminated oil shale from 1894.7 feet:
		X-ray - dolomite, quartz, feldspar, dawsonite.
1895.4	1897.0	Oil shale and some nahcolite: dark to medium brownish gray oil shale (10YR & 7.5YR 3/2-4/2). Very faint fairly smooth to distorted streaked bedding. Irregular to rare regular thick parting; slightly irregular to irregular fracture. Some very thin to thick fine grained nahcolite stringers and fine to small blebs.
1897.0	1899.0	Oil shale and nahcolite: dark to rare medium brownish gray oil shale (10YR 3/2, rare 4/2) and brownish black to some pale yellowish gray nahcolite. Very faint to faint distorted streaked bedding in oil shale. Common small to 4-inch, fine to moderately coarse crystalline nahcolite masses; some coarse radiating crystals in middle. Irregular thick parting; irregular to conchoidal fracture.
1899.0	1900.0	Oil shale and some nahcolite: dark to medium brownish gray oil shale (10YR 3/2-4/2). Faint fairly smooth to distorted streaked bedding. Irregular thick parting; slightly conchoidal to irregular fracture. Some medium to thin fine grained nahcolite stringers and small to fine blebs.
1900.0	1902.0	Oil shale and some nahcolite: dark to some medium brownish gray oil shale (10YR 3/2, some 4/2, rare 2/2 upper part); common satiny to resinous luster; some fine waxy streaks upper part. Faint distorted to some fairly smooth streaked bedding. Irregular thick parting; irregular and conchoidal to some irregular coarse hackly fracture. Some 2-inch masses and thin irregular stringers of coarsely crystalline nahcolite.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1902.0	1903.1	Oil shale: dark to medium brownish gray (10YR 3/2-4/2); common satiny and some resinous luster. Very faint slightly distorted streaked bedding. Irregular to slightly irregular thick parting; irregular to conchoidal fracture. Rare very fine short diagonal nahcolite-filled fractures in middle part.
1903.1	1904.4	Oil shale: dark to medium brownish gray and rare medium brown to tan (10YR & 2.5Y 3/2-5/2, rare 4/3-6/3). Moderately distinct slightly distorted laminae and stringers to very faint streaked bedding; common fine to small loop structures. Irregular to some slightly irregular and wavy thick parting; irregular to slightly conchoidal fracture. A small irregular pale brown to colorless nahcolite mass at 1903.2 feet. <div style="margin-left: 40px;"> Sample of brown to tan oil shale from 1903.3 feet:  X-ray - dolomite, quartz, feldspar. </div>
1904.4	1907.1	Oil shale and some nahcolite: medium to rare light brownish gray oil shale (10YR 4/2-5/2, rare 6/2). Very faint fairly smooth to distorted streaked bedding and rare moderately distinct streaks and stringers. Irregular thick parting; conchoidal to irregular fracture. Large to small, medium to coarse nahcolite masses and stringers at 1905.1-1905.5 and 1906.5-1907.1 feet. Some very fine vertical nahcolite-filled fractures in lower part.
1907.1	1908.2	Oil shale and rare nahcolite: medium to light and rare dark brownish gray oil shale (10YR 4/2-6/2, rare 3/2). Moderately distinct to faint, intricately contorted and displaced stringers and streaks in upper part; moderately distinct to very faint, fairly smooth to distorted laminae and streaked bedding with common fine displacements in lower part. Irregular to some slightly irregular thick parting; irregular fracture. Some small to 2-inch coarse radiating nahcolite masses near top and bottom.
1908.2	1909.6	Oil shale and nahcolite: medium to rare light and dark brownish gray oil shale (10YR 4/2-5/2, rare 6/2 and 3/2). Very faint distorted to smooth streaked bedding and some faint laminae in oil shale. Several large (up to 3-inch) dark coarsely crystalline radiating nahcolite masses in upper part; a 2-1/2-inch dense massive brown nahcolite band at 1909.3 feet. Irregular to wavy and rare fairly smooth thick parting; irregular to conchoidal fracture. Rare very fine vertical nahcolite-filled fractures.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of coarse radiating nahcolite mass from 1908.3 feet: X-ray - nahcolite, some quartz.
		Sample of dense massive nahcolite (and dolomite?) band from 1909.3 feet: X-ray - nahcolite, dolomite; some quartz, feldspar, dawsonite.
1909.6	1912.0	Oil shale and rare nahcolite: medium to light brownish gray and some buff oil shale (10YR 4/2-6/2, some 7/2 lower part). Very faint smooth to slightly distorted streaked bedding and some moderately distinct laminae. Slightly irregular to some very regular, thick to medium parting; slightly irregular to irregular and conchoidal fracture. Occasional thin dense to fine crystalline nahcolite streaks and stringers; some very small dark coarsely crystalline blebs in lower part. Some fine black pyritic rims with nahcolite in lower part. A very fine vertical nahcolite-filled fracture in lower 0.4 foot. Abrupt change to darker shale at base.
1912.0	1917.0	Oil shale and rare nahcolite: dark to medium brownish gray oil shale (10YR 3/2-4/2, very rare 5/2). Very faint to faint, fairly smooth to distorted streaked bedding. Irregular thick parting; slightly irregular to irregular and conchoidal fracture. Some small to 1-inch coarsely crystalline nahcolite masses in upper foot; rare small blebs and thin streaks to very fine disseminated crystals in other parts. Sample of dark brownish gray oil shale with fine nahcolite blebs and disseminated crystals from 1916.3 feet: X-ray - quartz, dolomite, feldspar, dawsonite, nahcolite, pyrite.
1917.0	1918.7	Oil shale and some nahcolite: medium and very rare dark brownish gray oil shale (10YR 4/2-5/2, rare 3/2). Very faint distorted streaked bedding. Very irregular thick parting; irregular fracture. Some very irregular fine grained nahcolite stringers and blebs in upper part; rare large coarse radiating masses in lower part. Some very tight vertical fractures with very fine patchy nahcolite (?) crusts in upper 3 inches.
1918.7	1919.9	Nahcolite and oil shale: dark brown to some pale yellowish brown nahcolite and medium and rare dark brownish gray to some buff oil shale (10YR 4/2-5/2, some 6/2-7/2, rare 3/2). Very coarse radiating nahcolite in upper 0.8 foot; oil shale with faint to

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		distinct distorted streaks and stringers in lower part. Irregular parting and fracture. Some distinct unconformities in oil shale.
1919.9	1921.0	Oil shale and rare nahcolite: dark to rare medium brownish gray oil shale (10YR 3/2, rare 4/2 & 2/2); rare satiny luster. Very faint slightly distorted to smooth streaked bedding. Irregular thick parting; slightly conchoidal fracture. A very irregular 2-inch fine to medium grained nahcolite stringer at 1920.2 feet.
1921.0	1923.1	Oil shale: dark and rare medium brownish gray (10YR 3/2, some 2/2, rare 4/2); rare satiny luster. Very faint smooth streaked bedding and rare laminae. Fairly regular to some irregular thick parting; slightly irregular and conchoidal fracture. A fine dense dark gray to brown lamina at 1921.8 feet. Sample of very dark slightly satiny oil shale from 1922.5 feet: X-ray - quartz, dawsonite, dolomite, feldspar, pyrite.
1923.1	1925.2	Oil shale and nahcolite: dark to light brownish gray and some buff oil shale (10YR 3/2-6/2, some 7/2 near top and bottom) and very dark brown to some pale yellowish brown nahcolite. Very faint to distinct, very distorted to slightly distorted streaks and some laminae in oil shale. Common small irregular blebs to 3-inch radiating masses of coarsely crystalline nahcolite. Irregular parting and fracture. Rare fine dark pyritic rims with nahcolite.
1925.2	1926.2	Oil shale: medium and some dark brownish gray and brown to rare tan (10YR 4/2 & 4/3-5/3, some 3/2, rare 6/3). Moderately distinct wavy laminae and some very faint streaked bedding; very common fine loop structures and displacements. Irregular to slightly irregular, thick to medium parting; irregular to rare coarse hackly fracture. Rare coarsely crystalline nahcolite masses on edge of core. Sample of distinctly laminated oil shale from 1925.7 feet: X-ray - quartz, dolomite, feldspar, calcite, dawsonite.
1926.2	1927.9	Oil shale and nahcolite: medium to some dark brownish gray and brown and rare tan to buff oil shale (10YR 4/2 & 4/3-5/3, some 3/2, rare 6/3-7/2 & 2/2). Distinct distorted and some smooth laminae to very faint streaked

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		bedding in oil shale. Some 1- to 2-inch dark coarse radiating nahcolite masses; a 3-inch light brownish gray fine to medium grained nahcolite band at 1926.6 feet. Irregular and rare fairly regular thick parting; irregular to conchoidal fracture. Rare short tight vertical fractures.
1927.9	1930.9	Oil shale and nahcolite: medium and rare dark brownish gray and brown to some tan and rare buff oil shale (10YR 4/2 & 4/3-5/3, some 6/3, rare 3/2 & 7/2) and dark brownish gray to medium brown nahcolite. Distinct to very faint, fairly smooth to distorted and wavy laminae and streaked bedding in oil shale. Common thin stringers and small blebs to 4-inch bands of fine crystalline to dense massive nahcolite. Irregular to some regular, thick to medium parting; irregular to slightly conchoidal fracture. Some very fine discontinuous vertical nahcolite-filled fractures in middle part. Rare very small coarse nahcolite blebs near base.
1930.9	1931.9	Oil shale and nahcolite: medium and rare dark brownish gray to some tan and rare buff oil shale (10YR 4/2 & 4/3-5/3, some 6/3, rare 3/2 & 7/2) and very dark brown to some pale yellowish brown nahcolite. Distinct to faint, wavy to smooth laminae in oil shale. A 4-inch coarse radiating nahcolite mass at 1931.2 feet; some thin fine grained nahcolite stringers and small coarse blebs in other parts. Slightly irregular wavy to flat, thick to medium parting; irregular to slightly conchoidal fracture. Rare very fine vertical nahcolite-filled fractures.
1931.9	1933.4	Oil shale and nahcolite: medium to rare dark brownish gray and some brown to rare tan and buff oil shale (10YR 4/2-5/2, some 4/3-5/3, rare 3/2 & 6/3-7/2) and medium brownish gray and brown nahcolite. Very faint fairly smooth to distorted streaked bedding and rare distinct streaks and stringers in oil shale. Common very thin stringers and streaks to 2-inch bands of very fine crystalline nahcolite. Fairly regular to irregular thick parting; slightly irregular to irregular fracture. A very thin dark gray silty-textured band with some fine nahcolite (?) blebs at 1932.7 feet. Some very fine nahcolite-filled vertical fractures at 1932.1-1932.3 and 1933.0-1933.5 feet. <div style="margin-left: 40px;"> Sample of thin dark gray band from 1932.7 feet:  X-ray - quartz, dolomite, dawsonite, nahcolite, feldspar. </div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1933.4	1934.4	Oil shale and some nahcolite: medium brownish gray and brown to some tan and buff oil shale (10YR 4/2 & 4/3-5/2 & 5/3, some 6/3-7/2 middle part). Faint and some distinct, slightly distorted to smooth laminae in oil shale; some very fine displacements and one very thin horizontal fold in middle part. Slightly irregular thick to medium parting; irregular to slightly irregular fracture. A 1/2-inch very fine crystalline nahcolite band at 1933.5 feet and a 1-1/2-inch irregular stringer at 1933.6 feet; rare fine streaks, stringers, and small coarse blebs in other parts. Some very fine vertical nahcolite-filled fractures near top and bottom. Very abrupt change to dark faintly bedded shale at base.
1934.4	1938.3	Oil shale: dark brownish gray and very rare medium brown (10YR 3/2, rare 4/3 lower part). Very faint smooth and rare distorted streaked bedding. Regular to irregular thick parting; fairly regular fracture. Common fine crystalline streaks and patches with some pyrite. A thin brown very fine grained nahcolite (?) stringer at 1934.5 feet; a 3-inch coarse radiating nahcolite mass at 1937.3 feet. <div style="margin-left: 40px;"> Sample of oil shale with fine crystalline streaks from 1936.5 feet:  X-ray - quartz, dolomite, feldspar, dawsonite, nahcolite, pyrite. </div>
1938.3	1940.6	Oil shale and nahcolite: medium brown to rare dark brownish gray and tan oil shale (10YR 5/3-4/3, rare 3/2 & 6/3) and dark brownish gray to medium brown nahcolite. Faint to moderately distinct, fairly smooth to distorted streaked bedding in oil shale. Slightly irregular to irregular thick parting; slightly irregular to irregular and conchoidal fracture. Dark brownish gray dense to fine crystalline nahcolite with rare moderately coarse blebs from 1938.5 to 1939.1 feet; very irregular brownish gray to brown, dense to very fine crystalline nahcolite stringers from 1939.5 to 1939.8 feet; dense brown to rare dark brownish gray, faintly banded to massive nahcolite with some thin shale partings from 1940.0 to 1940.5 feet; some very thin nahcolite stringers and rare small blebs in other parts. Abrupt change to dark faintly bedded shale at base. <div style="margin-left: 40px;"> Sample of dark brownish gray dense to fine crystalline nahcolite with some moderately coarse blebs from 1938.8 feet:  X-ray - nahcolite, quartz, dolomite, feldspar, dawsonite. </div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1940.6	1942.3	Oil shale and nahcolite: dark brownish gray oil shale (10YR 3/2) and dark to medium brownish gray nahcolite. Very faint smooth to distorted streaked bedding in oil shale. Common thin to 2-inch stringers of dense to very fine grained nahcolite with rare small to large coarsely crystalline patches. Slightly irregular to irregular thick parting; fairly regular to irregular and conchoidal fracture.
1942.3	1943.0	Nahcolite: very dark brown to some pale yellowish brown. Very coarse crystals in large multiple radiating aggregates; common fine interstitial shale partings. Some interfingering shale stringers at top and bottom.
1943.0	1944.8	Oil shale and rare nahcolite: dark to medium brownish gray and some brown oil shale (10YR 3/2-4/2, some 4/3). Faint smooth to slightly distorted streaked bedding and some laminae. Irregular to slightly irregular thick parting; slightly conchoidal to irregular and some coarse hackly fracture. Some <u>very</u> fine disseminated crystals (pyrite in part). Some small radiating pyrite nodules at 1943.5 feet. A 2-inch coarsely crystalline nahcolite mass at 1943.6 feet.
1944.8	1946.3	Oil shale and nahcolite: dark to medium brownish gray and brown oil shale (10YR 3/2-4/2 & 4/3) and dark brownish gray to pale brown nahcolite. Faint fairly smooth laminae to very faint distorted streaked bedding in oil shale. Large medium to coarse crystalline nahcolite masses at 1944.8-1945.1, 1945.6-1945.9, and 1946.0-1946.1 feet. Slightly irregular to irregular thick parting; slightly irregular to irregular and rare slight hackly fracture.
1946.3	1947.4	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, very rare 5/2). Faint contorted to fairly smooth streaked bedding. Irregular to slightly irregular thick parting; irregular to slightly irregular fracture. Very rare fine dense brown blebs. (Footage adjustment--interval is actually 1.3 feet thick.)
1947.4	1948.8	Oil shale and nahcolite: medium to some dark and rare light brownish gray and brown oil shale (10YR 4/2-5/3, some 3/2, rare 6/2) and very dark brown to pale yellow nahcolite. Very faint distorted streaked bedding and some moderately distinct streaks and laminae in oil shale. Common 1- to 3-inch coarse radiating nahcolite masses. Irregular thick parting; slightly conchoidal to irregular fracture.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1948.8	1951.2	Oil shale and nahcolite: medium brown to rare dark brownish gray oil shale (10YR & 2.5Y 5/3-4/3 & 4/2, rare 3/2) and very dark brown to rare pale yellow nahcolite. Moderately distinct to very faint distorted streaks, stringers, and laminae in oil shale. 1- to 4-inch coarse radiating nahcolite masses at 1949.0, 1949.4, 1950.6, and 1951.0 feet. Irregular to slightly irregular thick parting; irregular to conchoidal fracture.
1951.2	1952.4	Oil shale: medium brown to some dark brownish gray (10YR & 2.5Y 5/3-4/2, some 3/2 lower part). Very faint fairly smooth streaked bedding with common very fine buff lenses and streaks in upper half; faint smooth to slightly distorted streaks and some laminae in lower half. Irregular to slightly irregular thick parting; slightly irregular to irregular fracture. A small irregular gray to brownish gray nodule at 1951.9 feet.
1952.4	1953.6	Oil shale and some nahcolite: medium brownish gray and brown to some tan and buff oil shale (10YR 5/2 & 5/3-4/2, some 6/3-7/2 upper part). Moderately distinct to very faint, smooth to some distorted laminae and streaked bedding; common fine to small loop structures and displacements in upper part. Fairly regular to irregular thick parting; slightly conchoidal to some irregular fracture. Rare short irregular vertical fractures with dark brown resinous coatings in middle part. A 2-inch coarse radiating nahcolite mass at 1953.3 feet.
1953.6	1954.8	Oil shale: medium to rare light and dark brownish gray and brown in upper part (10YR 5/2 & 5/3-4/2, rare 6/2-6/3 & 3/2) and dark brownish gray in lower 0.3 foot (10YR 3/2). Moderately distinct to faint smooth laminae with some very fine loop structures in upper part; very faint smooth streaked bedding in lower 0.3 foot. Irregular to some very regular, thick to medium parting; irregular to smooth fracture. Common very fine disseminated pyrite in upper part.
1954.8	1955.8	Oil shale and nahcolite: medium brownish gray oil shale (10YR 4/2, very rare 5/2). Very faint smooth laminae to slightly distorted streaked bedding. Slightly irregular to irregular thick parting; fairly smooth to irregular fracture. Common very fine disseminated pyrite in upper part. A 4-inch coarse radiating nahcolite mass in middle.

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Laramie Petroleum Research Center, Laramie, Wyoming

April 6, 1967



# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1955.8	1960.8	Oil shale and some nahcolite: dark and rare medium brownish gray oil shale (10YR 3/2, rare 4/2 middle and lower parts). Very faint smooth to distorted streaked bedding. Irregular thick parting; slightly conchoidal and irregular fracture. A very coarsely crystalline nahcolite mass with common fine interstitial shale partings at 1959.0-1959.8 feet. A thin gray silty-textured pyritic stringer near base.
1960.8	1962.5	Oil shale and some nahcolite: dark to medium brownish gray oil shale (10YR 3/2-4/2) and dark to pale brown nahcolite. Faint fairly smooth to distorted laminae and some very faint streaked bedding in oil shale. Large coarse irregular to radiating nahcolite masses at 1961.3-1961.5 and 1961.8-1962.0 feet. Irregular thick parting; conchoidal to irregular fracture.
1962.5	1963.7	Oil shale and nahcolite: medium to rare dark brownish gray and buff oil shale (10YR 4/2-5/2, some 6/2, rare 3/2 & 7/2) and very dark to pale brown nahcolite. Faint to some moderately distinct, distorted and displaced to fairly smooth laminae and streaked bedding in oil shale. Very coarse radiating nahcolite at 1962.8-1963.2 feet; some 1- to 2-inch masses in other parts. Irregular thick parting; slightly irregular to irregular fracture.
1963.7	1965.5	Oil shale: medium to rare light and dark brownish gray (10YR 4/2, some 5/2, rare 6/2 upper part, rare 3/2 lower part). Very faint fairly smooth streaked bedding and some faint to rare moderately distinct laminae. Irregular to slightly irregular thick parting; slight hackly to slightly irregular fracture. Fairly common <u>very</u> fine disseminated crystals (pyrite in part?). A fine tan blebby crystalline lamina at 1964.8 feet.
		Sample of fine tan crystalline lamina in medium brownish gray oil shale from 1964.8 feet: X-ray - albite, dolomite, quartz.
1965.5	1968.5	Oil shale: dark and rare medium brownish gray (10YR 3/2, some 2/2 middle part, rare 4/2 upper and lower parts); some very slight satiny luster and rare fine resinous streaks in upper and middle parts. Irregular to slightly irregular thick parting; irregular to slightly irregular fracture. Rare to fairly common <u>very</u> fine disseminated crystals. Very rare very fine waxy black lenses (fossils?). A 1-inch zone of common very small to 3/4-inch fine grained nahcolite masses at 1965.8 feet.

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Laramie Petroleum Research Center, Laramie, Wyoming

April 6, 1967

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1968.5	1970.5	Oil shale and nahcolite: dark brownish gray to medium brown and some tan oil shale (10YR 3/2-5/3, some 6/3) and brownish black to some pale brown nahcolite. Faint to some distinct distorted streaked bedding in upper and lower parts; fairly distinct smooth laminae with common very fine displacements and loop structures in middle part. Irregular to slightly irregular thick parting; irregular and conchoidal to some slight hackly fracture. Common small coarsely crystalline nahcolite blebs at 1968.6-1969.0 feet; a coarse radiating nahcolite mass at 1969.9-1970.4 feet. Very rare fine waxy black lenses.
1970.5	1971.7	Oil shale: dark brownish gray (10YR & 7.5YR 3/2-2/2). Very faint smooth to very slightly distorted streaked bedding. Irregular thick parting; slightly irregular and conchoidal fracture. Some resinous to vitreous black fossil fragments on parting surfaces at 1970.8 feet. Some fine brown crystalline blebs and very fine disseminated crystals in lower part.
1971.7	1972.8	Oil shale: dark brownish gray and some black (10YR 3/2-2/2, some 1/2 upper part); rare satiny luster. Very faint smooth to rare slightly distorted streaked bedding. Irregular thick parting; slightly irregular and conchoidal fracture. Very rare very fine resinous to vitreous black blebs. A very fine light buff slightly earthy streak at 1972.7 feet.
1972.8	1973.8	Oil shale: dark brownish gray and very rare black (10YR 3/2-2/2, rare 1/2); rare satiny luster. Very faint very slightly distorted to smooth streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Some very fine disseminated crystals and rare fine crystalline blebs in lower part. Abrupt change to leaner shale at base. Sample of shale with some very fine crystals and crystalline blebs from 1973.5 feet: X-ray - quartz, dolomite, feldspar, dawsonite.
1973.8	1975.7	Oil shale: medium and some dark to rare light brownish gray and brown (10YR 4/2-4/3, some 3/2 upper part, rare 5/3-6/2). Faint slightly distorted to smooth streaked bedding and some laminac; some very fine loop structures and displacements. Irregular to slightly irregular thick parting; slightly irregular and conchoidal fracture. Rare fine tan to buff, crystalline to earthy streaks. Very rare fine gray pyritic (?) streaks.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1975.7	1978.4	Oil shale: dark brownish gray to some black, some medium brownish gray at 1977.7-1978.1 feet (10YR 3/2-2/2, some 1/2 & 4/2). Very faint slightly distorted streaked bedding. Irregular thick parting; slightly irregular and conchoidal fracture. Some very fine disseminated crystals and fine crystalline streaks and blebs.
1978.4	1979.5	Oil shale: very dark brownish gray to black (10YR 2/2-1/2). Very faint smooth streaked bedding. Slightly irregular to very regular, thick to medium parting; slightly irregular to some hackly fracture. Very common very fine disseminated crystals and crystalline streaks (dawsonite). <div style="margin-left: 40px;">Sample of black shale with common very fine dawsonite from 1978.6 feet:  X-ray - quartz, dawsonite, feldspar, dolomite, pyrite, illite.</div>
1979.5	1980.5	Oil shale: dark to some medium brownish gray and black (10YR 2/2-3/2, some 1/2 upper part, some 4/2 lower part). Very faint smooth to slightly distorted streaked bedding and some laminae; rare fine loop structures. Regular to slightly irregular, thin shaly to some papery parting; very hackly fracture. Rare very fine dense pyritic streaks. Some 1/2-inch brownish black silty-textured lenses at 1979.9 feet. <div style="margin-left: 40px;">Sample of small black silty-textured lenses from 1979.9 feet:  X-ray - quartz, feldspar, ferroan.</div>
1980.5	1986.0	Oil shale: dark to some medium brownish gray (10YR & 7.5YR 3/2, some 4/2). Very faint smooth to slightly distorted streaked bedding. Regular to slightly irregular, thin shaly to papery parting; very hackly fracture. Fairly common very fine dark dense crystalline streaks. Rare very thin brown to tan, dense to silty-textured laminae and streaks. Some very fine disseminated crystals in lower part. <div style="margin-left: 40px;">Sample of papery shale with some very fine dark dense streaks from 1980.9 feet:  X-ray - quartz, illite, feldspar, dolomite, ferroan, pyrite.</div>
1986.0	1988.0	Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Very faint smooth to slightly distorted streaked bedding. Regular to slightly irregular, thick to medium parting; hackly fracture. Very common very fine disseminated crystals and crystalline streaks. A very thin brown dense to silty crystalline laminae at 1986.7 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of oil shale with common very fine disseminated crystals and crystalline streaks from 1987.1 feet: X-ray - quartz, dawsonite, dolomite, feldspar, pyrite, illite.
1988.0	1990.0	Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Very faint smooth streaked bedding. Regular to slightly irregular, thick to thin parting; fine to coarse hackly fracture. Common <u>very</u> fine disseminated crystals and some crystalline streaks.
1990.0	1992.0	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, rare 5/2). Faint smooth streaked bedding and some laminae. Slightly irregular to regular, thick to medium parting; coarse hackly to slightly irregular and conchoidal fracture. Some <u>very</u> fine disseminated crystals. A fine brown dense to silty-textured laminae at 1991.7 feet.
		Sample of fine brown lamina from 1991.7 feet: X-ray - quartz, feldspar, dolomite, dawsonite.
1992.0	1993.6	Oil shale: very dark to rare medium brownish gray (10YR & 7.5YR 2/2-3/2, rare 4/2); common satiny to some resinous luster in lower part. Very faint fairly smooth laminae and streaked bedding; common fine to small loop structures in lower part. Regular to irregular thick parting; irregular and conchoidal to some very coarse hackly fracture. A fine brown lamina at 1993.1 feet (like 1991.7 feet).
1993.6	1993.9	Oil shale and nahcolite: medium brown to rare tan and dark brownish gray oil shale (10YR & 7.5YR 4/3-5/3, rare 6/3 & 3/2) and very dark brownish gray to some pale grayish yellow nahcolite. Very faint slightly distorted streaked bedding in upper part to moderately distinct smooth laminae in lower part. Common thin fine to medium crystalline nahcolite stringers in upper part. Irregular to regular thick parting; slightly irregular to smooth fracture. Some fine dark gray streaks and very fine scattered blebs in lower part.
1993.9	1995.0	Nahcolite: tan to brown. Massive, dense to very fine crystalline. Rare fine dark gray to black streaks and fracture fillings. Rare fine oil-shale laminae. Sample of massive tan nahcolite from 1994.2 feet: X-ray - nahcolite.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
1995.0	1996.8	Oil shale and nahcolite: medium brown and brownish gray oil shale (10YR & 7.5YR 4/3-4/2, rare 5/3) and medium to dark brown and some dark gray nahcolite. Very faint smooth laminae and streaked bedding in oil shale. Very faintly banded dense nahcolite at 1995.4-1995.6, 1995.7-1995.8, and 1996.0-1996.4 feet; some thin bands to fine streaks in other parts. Slightly irregular to regular thick parting; slightly irregular and rare hackly fracture. Some very fine disseminated crystals in oil shale.
		[ Sample of thin dark gray nahcolite (?) band from 1995.7 feet:
1996.8	1998.4	X-ray - nahcolite; some quartz, dawsonite, ferroan? Oil shale and nahcolite: medium to dark brown and brownish gray oil shale (7.5YR & 10YR 4/3 & 4/2-3/3 & 3/2). Very faint smooth to slightly distorted bedding. Very common fine to moderately coarse disseminated nahcolite crystals; some fine streaks to small blebs. Slightly irregular to irregular thick parting; slightly irregular to irregular fracture.
1998.4	1999.5	Oil shale and nahcolite: dark brown and brownish gray oil shale (7.5YR 3/3-3/2, very rare 2/2) and brownish black to pale yellowish brown and rare colorless nahcolite. Very faint very distorted to some fairly smooth streaked bedding in oil shale. Common small to large irregular coarsely crystalline nahcolite masses in upper part; common thin fine grained stringers in lower part. Very irregular parting and fracture.
1999.5	2001.8	Oil shale and nahcolite: dark to rare medium brownish gray and brown oil shale (7.5YR & 10YR 3/2-3/3, some 2/2 lower part, rare 4/3-5/3). Very faint fairly smooth to distorted streaked bedding in oil shale. Common very small to 1-inch dark coarse radiating nahcolite masses and rare fine grained stringers; a 2-inch dense brown to brownish gray nahcolite stringer at 1999.9 feet. Irregular thick parting; irregular to conchoidal fracture. A fine vertical nahcolite-filled fracture in lower 0.2 foot. Abrupt change to leaner laminated oil shale at base.
2001.8	2003.0	Nahcolite and oil shale: medium brown to dark brownish gray nahcolite and dark brownish gray to medium brown and rare tan oil shale (10YR 3/2-5/3, rare 6/3). Moderately distinctly laminated oil shale in upper 0.5 foot with common very thin dense nahcolite laminae and a thick irregular stringer near top; dense faintly

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2003.0	2004.0	laminated and banded nahcolite with some fine shale laminae in lower part. Slightly irregular to irregular thick parting; slightly irregular to very irregular and conchoidal fracture. Oil shale and nahcolite: medium to some light and dark brownish gray oil shale (10YR 4/2, some 5/2-6/2 & 3/2) and medium to dark brownish gray nahcolite. Faint fairly smooth laminae to very faint streaked bedding in oil shale. Fairly common very thin to 1-inch, dense to fine crystalline nahcolite bands and stringers. Fairly regular to irregular thick parting; slightly irregular to regular fracture.
2004.0	2005.0	Nahcolite and oil shale: tan to medium brown and some dark brownish gray nahcolite and medium to some dark brown and brownish gray oil shale (10YR 5/3 & 5/2-4/2, some 3/2). Dense massive to faintly banded and laminated nahcolite. Some thin to 2-inch faintly laminated oil-shale bands.
2005.0	2006.0	Oil shale and some nahcolite: dark to medium brownish gray and brown oil shale (10YR 3/2-4/2 & 4/3, rare 5/3). Very faint slightly distorted to smooth streaked bedding and rare laminae. Irregular thick parting; irregular to slightly conchoidal and rare slight hackly fracture. Some fine to 1-inch, dense to coarse crystalline nahcolite blebs in upper part; some thin to 1-inch, dense to fine crystalline stringers and bands in lower part.
2006.0	2007.3	Oil shale and some nahcolite: medium to some light and rare dark brownish gray and brown oil shale (10YR 4/2-5/2 & 5/3, some 6/2, rare 3/2). Faint slightly distorted to smooth streaked bedding and rare laminae. Slightly irregular to some very regular, thick to medium parting; slightly conchoidal to hackly fracture. Some fine streaks and laminae to 3/4-inch bands of dense to very fine crystalline nahcolite. (Footage adjustment--interval is actually 1.8 feet thick.)
2007.3	2008.4	Oil shale and nahcolite: dark and rare medium brownish gray oil shale (10YR 3/2-2/2, rare 4/2 near top and bottom) and medium to pale brown and some colorless nahcolite. Very faint fairly smooth to very distorted streaked bedding in oil shale. Common very thin streaks and stringers to rare 3/4-inch bands of dense to moderately coarse crystalline nahcolite. Irregular thick parting; slightly irregular to very irregular fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2008.4	2009.4	Oil shale and rare nahcolite: medium and rare dark brownish gray oil shale (10YR 4/2, rare 3/2). Very faint smooth streaked bedding and rare laminae. Slightly irregular to regular, thick to medium parting; slightly irregular and rare coarse hackly fracture. A 1/2- to 3/4-inch dense nahcolite stringer at 2008.7 feet; rare fine to thin stringers and laminae in other parts; a 1-inch dark coarse radiating nodule with black pyritic rims at 2008.9 feet. <div style="border-left: 1px solid black; padding-left: 10px; margin-left: 20px;"> Sample of oil shale from 2008.8 feet:  X-ray - dolomite, quartz, ferroan, feldspar, dawsonite. </div>
2009.4	2012.0	Oil shale and some nahcolite: very dark to rare medium brownish gray oil shale (10YR 2/2-3/2, rare 4/2); rare satiny luster. Very faint to faint, fairly smooth to distorted streaked bedding. Irregular thick parting; slightly conchoidal to irregular fracture. Some fine to 1-inch, dense to medium crystalline nahcolite stringers in upper 0.4 foot; a large irregular medium to coarse crystalline mass at 2011.6-2011.9 feet; rare very small to 3/4-inch blebs in other parts. Some <u>very</u> fine disseminated crystals in oil shale.
2012.0	2013.2	Oil shale: dark brownish gray (7.5YR 3/2, some 2/2); common satiny to resinous and rare waxy luster. Very faint slightly distorted to smooth laminae and streaked bedding; common fine to small loop structures in upper part. Slightly irregular to irregular thick parting; slightly irregular to irregular and rare very slight hackly fracture. Very rare fine crystalline streaks and very small blebs.
2013.2	2015.3	Oil shale and some nahcolite: medium brown to some dark brownish gray and rare tan oil shale (10YR 4/3-4/2, some 5/3-5/2 & 3/2, rare 6/3-6/2 upper part). Very faint smooth to distorted streaked bedding; rare fairly distinct laminae in upper part. Slightly irregular to irregular thick parting; fairly regular to irregular and conchoidal fracture. Common radiating to irregular masses and stringers of coarse to medium crystalline nahcolite at 2014.0-2014.3 and 2015.6-2015.7 feet. Rare fine dense crystalline blebs and <u>very</u> fine disseminated crystals.
2015.3	2016.4	Oil shale and some nahcolite: dark brownish gray to some medium brown and rare black oil shale (10YR & 7.5YR 3/2-2/2, some 4/3 upper part, rare 1/2 lower part);

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		some satiny to rare resinous luster in lower part. Very faint distorted to fairly smooth streaked bedding. Irregular thick parting; irregular and rare coarse hackly fracture. A 3-inch coarse radiating nahcolite mass at top and a 1-1/2 inch mass at 2016.2 feet.
2016.4	2017.5	<p>[ Sample of very dark brownish gray to black, satiny to resinous oil shale from 2016.4 feet: X-ray - feldspar, dolomite, quartz, pyrite.</p> <p>Oil shale and some nahcolite: medium and rare dark brownish gray to some buff oil shale (10YR 4/2-5/2, some 6/2-7/2, rare 3/2 upper part). Very faint smooth to some wavy and distorted streaked bedding and some faint to distinct laminae. Slightly irregular to irregular, thick to medium parting; irregular to very slight hackly fracture. A 2-inch coarse hackly radiating nahcolite mass at 2017.9 feet; several 1/2- to 1-inch very round masses with pyritic rims at 2018.2-2018.4 feet.</p>
2017.5	2018.8	<p>Nahcolite and oil shale: brownish gray nahcolite and medium to light brownish gray oil shale (10YR 4/2-6/2). Massive, very fine crystalline to dense nahcolite with very common fine to 1-inch wavy oil-shale partings. Irregular to regular and wavy thick parting; irregular fracture.</p> <p>[ Sample of very fine crystalline nahcolite from 2018.5 feet: X-ray - nahcolite; some quartz, dawsonite.</p>
2018.8	2022.0	<p>Oil shale and nahcolite: medium to some light and rare dark brownish gray oil shale (10YR 5/2-4/2, some 6/2, rare 3/2) and medium to dark brownish gray nahcolite. Very faint smooth to slightly distorted streaked bedding and rare laminae in oil shale. Fairly common fine to 2-inch, medium to very fine crystalline nahcolite stringers and bands. Fairly regular to irregular, thick to medium and rare thin parting; slightly irregular to irregular and rare hackly fracture.</p>
2022.0	2024.8	<p>Oil shale and rare nahcolite: dark brownish gray oil shale (10YR 3/2-2/2); rare satiny luster in lower part. Very faint fairly smooth to distorted streaked bedding. Irregular thick parting; slightly conchoidal to irregular fracture. Occasional very small to 1-inch coarsely crystalline nahcolite masses and irregular fine grained stringers.</p>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2024.8	2026.3	Oil shale: very dark brownish gray to black (10YR & 7.5YR 2/2-1/2, some 3/2 upper part); very common satiny to resinous luster. Very faint fairly smooth laminae and streaked bedding; common fine to small loop structures. Slightly irregular and wavy thick parting; irregular to slight hackly fracture.
2026.3	2027.0	Oil shale: dark to medium and very rare light brownish gray (10YR 3/2-4/2, rare 5/2-6/2). Very faint smooth streaked bedding and rare distinct laminae. Irregular to some regular, thick to medium parting; slightly conchoidal fracture. A very fine tight nahcolite-filled vertical fracture from 2026.5-2026.7 feet.
2027.0	2027.9	Oil shale: medium and very rare dark brownish gray and brown, some tan to buff upper part (10YR 4/2 & 4/3-5/3, some 6/3-7/2, rare 3/2). Faint fairly smooth laminae and streaked bedding; rare very fine loop structures and displacements. Slightly irregular to irregular thick parting; irregular to slightly conchoidal fracture. A very fine tight nahcolite-filled fracture from top to 2027.4 feet. A small coarse crystalline nahcolite mass and some very fine short irregularly oriented filled fractures near base.
2027.9	2028.3	Nahcolite: tan to brown. Fine grained, massive. Irregular contacts at top and bottom.
2028.3	2028.9	Oil shale and nahcolite: medium to very rare dark brownish gray and buff oil shale (10YR & 7.5YR 4/2, rare 3/2 & 5/2-7/2). Very faint wavy and distorted to smooth streaked bedding and rare faint to distinct laminae. Irregular to slightly irregular thick parting; irregular to slightly conchoidal fracture. A 2-inch irregular dark coarsely crystalline nahcolite mass at top; some very thin fine grained streaks and small blebs in middle part.
2028.9	2030.3	Nahcolite and oil shale: medium to dark brown and brownish gray nahcolite and medium brownish gray oil shale (10YR 4/2-5/2). Dense to very fine crystalline nahcolite with common fine to 1/2-inch oil-shale partings in upper 0.6 foot and lower 0.2 foot; faintly bedded oil shale with common fine nahcolite laminae in other parts. Irregular to slightly irregular thick parting; slightly irregular and conchoidal fracture.
2030.3	2031.3	Oil shale: medium to rare light and dark brownish gray (10YR 4/2-5/2, rare 6/2 & 3/2). Faint smooth streaked bedding and some laminae. Slightly irregular to very regular, thick to medium parting; slight hackly to

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		fairly regular fracture. Rare thin very fine grained nahcolite streaks and stringers. A nahcolite-filled fracture up to 5/8-inch wide extends from 2030.5 feet into section below (restricted to unsampled quarter of core).
2031.3	2032.5	Oil shale: medium to light brownish gray (10YR 5/2-6/2, rare 4/2). Faint smooth to slightly distorted streaked bedding and some laminae. Regular to slightly irregular thick parting; fairly regular to irregular fracture. Rare thin nahcolite stringers and fine blebs; several small coarse radiating masses at 2032.0 feet. Nahcolite-filled fracture up to 3/4-inch wide extends through interval; some long thin pendant wall rock slabs and small angular inclusions (horses); occasional small sharp offsets (nahcolite vein restricted to unsampled quarter of core).
		[ Sample of white nahcolite fracture filling from 2031.8 feet: X-ray - nahcolite.
2032.5	2034.5	Oil shale and some nahcolite: medium to light brownish gray oil shale (10YR 5/2-6/2, some 4/2 upper part). Faint smooth to some distorted laminae and streaked bedding. Slightly irregular to irregular, thick to medium parting; coarse hackly to irregular and some fairly regular fracture. Some 1-inch bands to fine stringers and streaks of dense brown to brownish gray nahcolite. Nahcolite filled fracture extends 0.2 foot into interval from above.
2034.5	2036.0	Nahcolite and some oil shale: tan to brown and brownish gray nahcolite and medium brownish gray oil shale (10YR 4/2-5/2). Fine crystalline nahcolite with some fine oil-shale stringers in upper and lower parts; oil shale with very faint slightly distorted streaked bedding and a 1/4-inch vertical nahcolite-filled fracture from 2035.2 to 2035.5 feet. Irregular parting and fracture.
2036.0	2037.6	Oil shale and nahcolite: medium brownish gray oil shale (10YR 4/2-5/2) and medium brown and brownish gray to tan and rare colorless nahcolite. Faint smooth to distorted streaked bedding and rare laminae in oil shale. Medium to fine crystalline nahcolite with common fine to thin wavy shale partings at 2036.2-2036.6 feet; very fine grained nahcolite with some fine shale partings at 2036.9-2037.1 feet; common fine to thin nahcolite stringers in other parts. Fairly regular to irregular, thick to medium parting; slightly irregular to irregular fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2037.6	2038.7	Oil shale and some nahcolite: medium brown and brownish gray oil shale (10YR 4/3-4/2). Very faint slightly distorted streaked bedding. Irregular thick parting; slightly irregular fracture. Common fine nahcolite blebs and streaks; some dense massive nahcolite bands near top.
2038.7	2039.7	Oil shale and nahcolite: dark brownish gray to medium brown oil shale (10YR 3/2-4/3) and dark to medium brownish gray nahcolite. Very faint smooth to slightly distorted streaked bedding in oil shale. Common fine stringers and laminae to 1-1/2-inch bands of fine grained nahcolite. Slightly irregular to irregular thick parting; slightly irregular and rare very slight hackly fracture.
2039.7	2041.7	Oil shale and nahcolite: dark brownish gray oil shale (10YR & 7.5YR 3/2) and dark to medium brownish gray and rare tan nahcolite. Very faint distorted streaked bedding in oil shale. Common small to 2-inch fine grained nahcolite masses, streaks, and stringers. Irregular parting and fracture. Some fine pyrite blebs.
2041.7	2043.4	Oil shale: dark brownish gray (10YR & 7.5YR 3/2, some 2/2 lower part). Very faint smooth streaked bedding. Irregular thick parting; slightly irregular fracture. Rare fine pyrite blebs.
2043.4	2044.1	Nahcolite and oil shale: brownish black to rare pale brown and colorless nahcolite and dark to medium brownish gray oil shale (10YR 3/2-4/2). Very large (up to 5-inch) coarsely crystalline radiating nahcolite masses in oil shale with faint very wavy streaked bedding. Irregular parting and fracture. <div style="margin-left: 40px;"> Sample of very dark coarse nahcolite from  2043.8 feet:  X-ray - nahcolite; trace quartz. </div>
2044.1	2045.7	Oil shale: dark and very rare medium brownish gray (10YR & 7.5YR 3/2, rare 2/2 & 4/2); rare satiny to resinous luster. Very faint fairly smooth laminae and streaked bedding; some fine loop structures. Irregular to some fairly regular thick parting; slightly conchoidal fracture.
2045.7	2047.1	Oil shale: very dark to some medium brownish gray and rare tan (10YR 2/2-3/2, some 4/2-5/3 and rare 6/3 middle part); common resinous to some waxy luster in upper and lower parts. Very faint to faint, smooth to slightly distorted laminae and streaked bedding; common fine to small loop structures. Irregular to slightly

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2047.1	2048.8	irregular thick parting; slightly irregular and conchoidal fracture. A short very fine tight high angle nahcolite-filled fracture at 2046.2 feet. Nahcolite and oil shale: dark brownish gray to some pale brown and very rare colorless nahcolite and dark to medium brownish gray oil shale (10YR 2/2-4/2). Medium to fine crystalline nahcolite with common irregular fine to 1-inch shale partings. Irregular parting and fracture.
2048.8	2050.6	Nahcolite and oil shale: very dark brownish gray to some pale brown nahcolite and dark to rare medium brownish gray oil shale (10YR 3/2-2/2, rare 4/2). Very fine to rare medium crystalline nahcolite with common very fine shale partings to rare 3/4-inch stringers. Irregular parting and fracture.
2050.6	2052.6	Oil shale and nahcolite: medium to dark brownish gray and rare medium brown to tan oil shale (10YR 4/2-3/2, rare 5/3-6/3 middle part) and brownish black to dark brownish gray nahcolite. Very faint distorted to smooth streaked bedding and rare distinct laminae and streaks in oil shale. Common small to 3-inch coarse radiating nahcolite masses; rare fine grained masses. Irregular to some slightly irregular thick parting; irregular to slightly conchoidal fracture. A short tight vertical fracture with vitreous black coatings at 2051.2 feet.
2052.6	2053.6	Oil shale and nahcolite: medium to very dark brownish gray oil shale (10YR & 7.5YR 4/2-2/2) and brownish black to dark brownish gray nahcolite. Very faint fairly smooth to distorted streaked bedding in oil shale. Common small to 2-inch coarse radiating nahcolite masses. Irregular thick parting; irregular to slightly conchoidal fracture. Common very fine disseminated crystals and crystalline streaks in lower part.
2053.6	2055.9	Oil shale; very dark brownish gray (10YR 2/2). Very faint slightly distorted to smooth streaked bedding. Irregular thick parting; irregular slight hackly fracture. Common very fine disseminated crystals and crystalline streaks.
2055.9	2057.0	<div style="display: flex; align-items: center;"> <div style="font-size: 4em; margin-right: 10px;">{</div> <div> <p>Sample of very dark shale with common very fine crystals and crystalline streaks from 2054.3 feet: X-ray - quartz, dolomite, dawsonite, feldspar, ferroan, pyrite.</p> <p>Nahcolite and oil shale: brownish black to rare pale brown nahcolite and dark brownish gray to medium brown oil shale (10YR 2/2-4/3). A very large coarse</p> </div> </div>

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		radiating nahcolite mass in upper 0.6 foot; oil shale with very faint fairly smooth streaked bedding and some small irregular coarsely crystalline nahcolite masses in lower part. Irregular parting and fracture.
2057.0	2061.3	Oil shale: very dark brownish gray (10YR 2/2). Very faint smooth to rare distorted streaked bedding. Fairly regular to irregular thick parting; fairly smooth to some irregular and conchoidal fracture. Common <u>very</u> fine disseminated crystals and crystalline streaks. A 2-inch coarse radiating nahcolite mass at 2060.0 feet.
2061.3	2063.6	Oil shale: dark and some medium brownish gray (10YR 3/2, some 4/1 lower part, rare 2/2). Very faint smooth to rare distorted streaked bedding. Slightly irregular to irregular thick parting; slightly irregular and conchoidal to rare coarse hackly fracture. Very common very fine disseminated crystals and crystalline streaks. A 2-inch coarsely crystalline radiating nahcolite mass at 2063.4 feet.
2063.6	2065.2	Oil shale and nahcolite: medium and rare dark brownish gray to some buff oil shale (10YR 4/2-5/2, some 6/2-7/2, rare 3/2) and brownish black to rare pale yellowish brown and colorless nahcolite. Distinct to some very faint distorted laminae and streaked bedding in oil shale. Very common nahcolite in large (up to 4-inch) coarse radiating to irregular masses. Very irregular parting and fracture. Some light colors in shale in lower part terminate laterally along bedding (bleaching?). Common very fine disseminated crystals in oil shale.
2065.2	2065.5	Missing.
2065.5	2066.6	Oil shale and nahcolite: medium to rare dark brownish gray and buff oil shale (10YR 4/2-4/1, some 5/2, rare 6/2-7/2 upper part, rare 3/2 lower part) and brownish black to dark brown nahcolite. Very faint smooth and some distorted laminae and streaked bedding in oil shale. Some coarse nahcolite at top and several large coarse radiating masses in lower 4 inches. Fairly regular to irregular thick parting; slight hackly to irregular fracture. Some very fine disseminated crystals.
2066.6	2067.7	Oil shale and nahcolite: dark brownish gray oil shale (10YR & 7.5 YR 3/2, some 2/2) and brownish black to rare pale brown nahcolite. Very faint distorted streaked bedding in oil shale. Common small to 2-inch coarse radiating to irregular nahcolite masses. Irregular thick parting; conchoidal to irregular fracture. Common very fine disseminated crystals and crystalline streaks. Abrupt change to leaner shale at base.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2067.7	2070.4	Oil shale and nahcolite: buff to medium brownish gray oil shale (10YR 7/2-5/2, rare 4/2) and medium brown to black nahcolite. Fairly distinct to faint, slightly distorted to smooth laminae and streaked bedding in oil shale. Massive brown to brownish gray, dense to very fine crystalline nahcolite bands at 2067.8-2068.0 and 2068.7-2069.0 feet; some thin to fine streaks and stringers in other parts; occasional very small to 1-inch dark coarsely crystalline nahcolite masses; common very fine dark nahcolite (?) blebs in upper part and some in lower part. Regular to rare irregular, thick to medium parting; slightly irregular to irregular fracture. <div style="margin-left: 40px;">Sample of buff to light brownish gray oil shale with common very fine dark nahcolite blebs from 2068.5 feet:  X-ray - quartz, dolomite, dawsonite, feldspar, ferroan, nahcolite.</div>
2070.4	2071.8	Oil shale and nahcolite: dark brownish gray to buff oil shale (10YR & 7.5YR 3/2-7/2). Dark faintly bedded oil shale with some large coarse nahcolite masses in upper 0.4 foot; buff to brownish gray oil shale with slightly distorted and commonly displaced to very smooth laminae and some fine crystalline streaks and laminae from 2070.8 to 2071.3 feet; medium to dark brownish gray oil shale with faint distorted streaked bedding and common thin fine grained nahcolite stringers in lower part. Regular to some irregular thick parting; slightly irregular to irregular fracture. Common very fine disseminated crystals in upper part.
2071.8	2076.0	Oil shale and some nahcolite: dark brownish gray oil shale (10YR & 7.5YR 3/2). Very faint smooth to slightly distorted streaked bedding. Slightly irregular to irregular thick parting; slightly conchoidal and irregular fracture. 2-inch coarse radiating nahcolite nodules at 2073.3 and 2075.1 feet; common fine nahcolite streaks and fine to small blebs in other parts. Fairly common very fine disseminated crystals. Very rare fine pyrite blebs.
2076.0	2080.0	Oil shale: dark brownish gray (10YR 2/2-3/2). Very faint smooth laminae and streaked bedding. Irregular to some fairly regular thick parting; irregular to slightly conchoidal fracture. A 2-inch fine grained nahcolite stringer at top; a 1-inch coarsely crystalline nodule at 2076.3 feet. A short tight vertical fracture with vitreous black coatings at 2079.3 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of oil shale from 2079.5 feet: X-ray - quartz, dawsonite, dolomite, ferroan, feldspar, pyrite.
2080.0	2082.0	Oil shale: dark to rare medium brownish gray (10YR 3/2-2/2, rare 4/2). Very faint smooth laminae and streaked bedding. Irregular to fairly regular thick parting; conchoidal to irregular fracture. A natural (?) vertical fracture from 2080.5 to 2081.0 feet.
2082.0	2083.5	Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Faint fairly smooth streaked bedding. Irregular thick parting; irregular fracture. Some very tight discontinuous natural vertical fractures with rare brown crystalline crusts at 2082.5-2082.9 feet.
2083.5	2084.5	Oil shale: medium to some dark and rare light brownish gray (10YR 4/2-5/2, some 3/2, rare 6/2). Faint to rare moderately distinct, distorted to fairly smooth laminae and streaked bedding. Irregular to slightly irregular, thick to medium parting; irregular to conchoidal fracture. A 1-1/2-inch radiating nahcolite nodule with black pyritic rims near top. Some tight nearly vertical fractures with vitreous black organic fillings in lower 0.4 foot.
2084.5	2086.7	Oil shale and nahcolite: medium to some dark brownish gray and brown oil shale (10YR 4/2-4/3, some 3/2, rare 5/2) and brownish black to some pale yellowish brown and rare colorless nahcolite. Faint distorted to some fairly smooth streaked bedding and rare laminae in oil shale. A very irregular large coarsely crystalline nahcolite mass near top; common 1- to 3-inch radiating nodules with pyritic rims in other parts. Irregular parting and fracture. Some vertical fractures with resinous brown to vitreous black coatings. Some irregular mixed up core pieces; true length doubtful.
2086.7	2089.0	Oil shale: medium and some dark brownish gray (10YR 4/2, some 3/2 upper part). Faint to <u>very</u> faint, slightly distorted to smooth streaked bedding and rare laminae. Irregular thick parting; conchoidal to irregular fracture. Common very fine disseminated crystals. A very fine waxy to vitreous black organic streaks at 2088.6 feet.
2089.0	2090.6	Oil shale and nahcolite: medium to some very dark brownish gray oil shale (10YR 4/2-3/2, some 2/2 lower part) and brownish black to some pale brown nahcolite. Very faint distorted streaked bedding in oil shale.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEG Colorado Corehole No. 1--Continued

From	To	Description
		Common very thin to 1-inch, medium to fine grained nahcolite stringers, streaks, and blebs in upper part; a 5-inch coarsely crystalline mass in lower part. Irregular thick parting; irregular to conchoidal fracture. Some <u>very</u> fine disseminated crystals in oil shale.
2090.6	2091.9	Nahcolite: brownish black to pale brown and rare colorless. Moderately coarse to some fine crystalline. Irregular thick parting; slightly irregular to irregular fracture. Some thin oil-shale stringers near top. Sample of moderately coarse nahcolite from 2091.5 feet: X-ray - nahcolite.
2091.9	2095.1	Oil shale and nahcolite: medium brownish gray and brown oil shale (10YR 4/2-4/3, some 5/3 upper part) and medium to dark brownish gray nahcolite. Very faint fairly smooth to some distorted streaked bedding in oil shale. Very common very fine disseminated nahcolite and some massive fine grained stringers. Slightly irregular to irregular thick parting; slightly irregular to irregular fracture. Rare vertical fractures with resinous brown and some light blue-gray coatings in upper part. Some small coarsely crystalline nahcolite masses at 2092.5-2092.7 feet.
2095.1	2101.0	Oil shale and nahcolite: dark to some medium brownish gray oil shale (10YR 3/2, some 4/2) and brownish black to rare medium and pale brown nahcolite. Very faint distorted to some fairly smooth streaked bedding in oil shale. Common fine nahcolite blebs to 1-1/2-inch coarse radiating and irregular nodules--some with pyritic rims. Irregular thick parting; irregular to some conchoidal fracture. Common <u>very</u> fine disseminated crystals.
2101.0	2103.4	Oil shale and some nahcolite: dark to some medium brownish gray oil shale (10YR 3/2, some 4/2). Very faint slightly distorted to smooth streaked bedding. Irregular thick parting; irregular fracture. Fairly common fine pyritic nahcolite blebs and streaks. A very fine tight irregular nahcolite-filled vertical fracture at 2101.7-2102.1 feet; rare short tight fractures in other parts.
2103.4	2104.1	Nahcolite and oil shale: brownish black to pale brown nahcolite and medium to dark brownish gray oil shale (10YR 4/2-3/2, rare 2/2). Large irregular fine to medium grained nahcolite masses in distorted oil shale. Irregular parting and fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2104.1	2105.5	Oil shale: dark brownish gray (10YR 3/2, some 2/2). Very faint slightly distorted to smooth streaked bedding. Irregular to slightly irregular thick parting; irregular to slightly conchoidal fracture. Common <u>very</u> fine disseminated crystals. Rare small nahcolite blebs and thin to fine stringers and streaks. Rare diagonal to vertical fractures with resinous brown to black coatings.
2105.5	2106.2	Nahcolite and some oil shale: brownish black to some medium and rare pale brown nahcolite and dark brownish gray oil shale (10YR 3/2). Very coarsely crystalline nahcolite; some irregular broken oil-shale partings in upper part. Very irregular parting and fracture.
2106.2	2106.8	Oil shale: dark brownish gray (10YR 3/2). Very faint fairly smooth streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Common very fine disseminated crystals and crystalline streaks. A 1-inch radiating nahcolite mass at 2106.6 feet.
2106.8	2109.0	Oil shale and some nahcolite: medium to dark brownish gray and brown oil shale (10YR 4/2 & 4/3-3/2). Very faint smooth to some distorted streaked bedding. Very irregular parting and fracture. Some large coarse radiating nahcolite masses in upper part; some thin fine grained stringers in lower part. Common <u>very</u> fine disseminated crystals. A 1/4-inch nahcolite-filled vertical fracture in lower part. Irregular mixed up core pieces; true length doubtful.
2109.0	2111.0	Oil shale and some nahcolite: dark and rare medium brownish gray oil shale (10YR 3/2, rare 4/2). Very faint slightly distorted to smooth streaked bedding. Irregular thick parting; irregular fracture. Common very fine disseminated crystals. Some fine grained nahcolite streaks and stringers and rare coarse radiating nodules.
2111.0	2113.2	Oil shale and some nahcolite: dark and some medium brownish gray oil shale (10YR 3/2, some 4/2). Very faint fairly smooth to some distorted streaked bedding. Irregular thick parting; irregular to some fairly smooth fracture. Some fine grained nahcolite streaks; some 1- to 2-inch coarse radiating nodules in lower 0.3 foot. Common very fine disseminated crystals. Some irregular vertical fractures with resinous black coatings in upper part. (Footage adjustment--interval 2111.0-2112.0 is 1.4 feet thick.)

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2113.2	2115.4	Oil shale: medium and rare dark brownish gray (10YR 4/2, rare 3/2-2/2). Very faint slightly distorted to smooth streaked bedding; a very faint overturned fold at 2114.4-2114.5 feet. Irregular thick parting; slightly irregular and conchoidal fracture. Fairly common very fine disseminated crystals. Some fine nahcolite streaks and blebs in upper 0.4 foot; a very thin pyritic nahcolite stringer and some fine pyrite blebs near base. Rare short tight vertical fractures with black organic coatings in upper part.
2115.4	2118.5	Oil shale: dark brownish gray (10YR & 7.5YR 3/2-2/2); rare slight satiny luster. Very faint smooth laminae and streaked bedding. Irregular thick parting; fairly smooth to conchoidal fracture. Fairly common very fine disseminated crystals; some very fine crystalline streaks in lower part. Rare very short tight vertical fractures with brown to black coatings in lower part.
2118.5	2120.0	Oil shale and nahcolite: dark brownish gray oil shale (10YR & 7.5YR 3/2-2/2) and brownish black to rare pale yellowish brown nahcolite. Very faint distorted streaked bedding and rare laminae in oil shale. Common small to large (up to 5-inch) coarse radiating nahcolite masses. Irregular thick parting; irregular to conchoidal fracture.
2120.0	2121.6	Oil shale and nahcolite: dark and some medium brownish gray oil shale (10YR & 7.5YR 3/2-2/2, some 4/2 middle part) and brownish black to medium brown nahcolite. Very faint distorted to some fairly smooth streaked bedding in oil shale. Common small to 4-inch dark coarse radiating nahcolite masses in upper and lower parts; very common very thin medium to dark brownish gray and gray fine grained nahcolite laminae from 2120.4 to 2120.6 feet; medium brown massive nahcolite from 2120.6 to 2121.0 feet. Irregular parting and fracture. Some very fine irregular vertical fractures and cross fractures with black pyritic fillings in massive nahcolite.
		<div style="border-left: 1px solid black; padding-left: 10px; margin-left: 20px;"> <p>Sample of interlaminated medium brownish gray oil shale and medium brownish gray to dark gray fine grained nahcolite from 2120.5 feet:</p> <p>X-ray - nahcolite, dolomite, quartz, dawsonite.</p> <p>Sample of massive brown nahcolite from 2120.7 feet:</p> <p>X-ray - nahcolite, quartz.</p> </div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2121.6	2123.3	Oil shale and nahcolite: medium to some dark brownish gray and brown oil shale (10YR 4/2-5/2 & 5/3, some 3/2, rare 2/2) and medium brownish gray and brown to rare, black nahcolite. Very faint distorted to fairly smooth streaked bedding and rare moderately distinct laminae in oil shale. Common fine laminae and stringers to 2-inch bands of very fine grained nahcolite; some small to 1-inch dark coarse nodules. Irregular to some fairly regular, thick to medium parting; irregular fracture. An irregular very fine to 3/16-inch vertical nahcolite-filled fracture from 2122.7 to 2123.2 feet.
2123.3	2125.1	Oil shale and nahcolite: medium to dark brownish gray and some tan to buff oil shale (10YR 5/2-3/2, some 6/3-7/2 lower part) and medium brown and brownish gray to some black nahcolite. Very faint to some distinct, distorted to smooth laminae and streaked bedding in oil shale. Common fine laminae and stringers to 3-inch bands of very fine crystalline to dense massive nahcolite; some small to 1-inch dark coarse radiating nodules at 2134.4-2134.7 feet. Irregular to regular and some wavy thick parting; irregular to slightly irregular fracture.
2125.1	2126.3	Nahcolite: tan to medium brown and some dark brownish gray. Dense, massive to faintly banded and laminated; fine to some moderately coarse crystalline in lower 2 inches. Irregular thick parting; conchoidal to irregular fracture. Differential solution on outside of core produced common ridges (darker) and grooves (lighter). <div style="margin-left: 40px;"> Sample of dense massive tan nahcolite from 2125.2 feet:  X-ray - nahcolite.  Sample of dark brownish gray and brown laminated nahcolite (or oil shale and nahcolite?) from 2125.5 feet:  X-ray - quartz, nahcolite, dolomite, dawsonite, feldspar.  Sample of fine to medium crystalline nahcolite from 2126.3 feet:  X-ray - quartz, nahcolite, dolomite. </div>
2126.3	2127.3	Oil shale and nahcolite: dark to medium brownish gray oil shale (10YR 3/2-4/2, rare 2/2 near base) and medium to dark brownish gray and rare black nahcolite. Very faint smooth to some distorted streaked bedding in

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		oil shale. Fairly common very thin laminae to 1-inch stringers of fine grained nahcolite; some small to 1-inch coarse radiating nodules in upper part. Fairly regular and some wavy thick parting; slightly irregular to irregular fracture. Common very fine disseminated crystals in oil shale. Some very fine short vertical nahcolite-filled fractures--rarely with vitreous black organic crusts.
2127.3	2128.8	Oil shale and nahcolite: dark to medium brownish gray and some brown oil shale (10YR 3/2-4/2, some 4/3 lower part, rare 5/2) and medium to dark brownish gray and brown nahcolite. Very faint to faint, slightly distorted to smooth laminae and streaked bedding in oil shale. Several thick distorted fine grained nahcolite stringers in upper half; common thin laminae to 3/4-inch bands of fine grained nahcolite in lower half; rare small coarse nahcolite nodules. Irregular thick parting; irregular to slightly irregular fracture. Common very fine disseminated crystals and crystalline streaks in oil shale. Some short fine to 1/4-inch nahcolite-filled fractures in upper part.
2128.8	2129.9	Nahcolite: medium brown to some tan. Massive to some faintly laminated, dense to very fine crystalline. Irregular thick parting; irregular to conchoidal fracture. A 1-inch band of medium to dark brownish gray oil shale at 2129.7 feet.
2129.9	2131.0	Oil shale and nahcolite: medium to dark brownish gray and brown oil shale (10YR 4/2 & 4/3-3/2) and medium brown to dark brownish gray and rare black nahcolite. Faint to very faint, smooth to some distorted laminae and streaked bedding in oil shale. A 3-inch very faintly laminated to massive, dense to very fine crystalline nahcolite band in middle; common thin fine grained nahcolite bands and stringers and some small coarse nodules in other parts. Slightly irregular to irregular thick parting; slightly irregular fracture. Common very fine disseminated crystals in oil shale.
2131.0	2133.5	Oil shale and nahcolite: dark to some medium brownish gray oil shale (10YR & 7.5YR 3/2, some 4/2) and brownish gray to brownish black nahcolite. Very faint to faint, smooth to distorted streaked bedding in oil shale. Some very thin to 1-1/2-inch fine grained nahcolite stringers and bands in upper part; fairly common

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		irregular small to 4-inch, coarse to rare fine crystalline nahcolite masses in lower part. Slightly irregular to irregular thick parting; irregular fracture. Common very fine disseminated crystals in oil shale.
2133.5	2134.5	Oil shale: dark brownish gray (10YR & 7.5YR 3/2). Very faint slightly distorted streaked bedding. Irregular thick parting; slightly irregular fracture. Common very fine disseminated crystals. Rare small coarse nahcolite masses and fine blebs.
		Sample of oil shale with common disseminated crystals from 2133.7 feet:
		X-ray - quartz, dolomite, dawsonite, feldspar.
2134.5	2136.5	Oil shale and nahcolite: dark brownish gray oil shale (10YR & 7.5YR 3/2, rare 2/2 lower part) and brownish black to some pale orangish brown and rare colorless nahcolite. Very faint fairly smooth to distorted streaked bedding in oil shale. Common small to 3-inch coarse radiating to irregular nahcolite masses; rare thin fine grained stringers and small masses. Irregular thick parting; irregular fracture. Fairly common very fine disseminated crystals in oil shale.
2136.5	2138.5	Oil shale and nahcolite: dark brownish gray oil shale (10YR & 7.5YR 3/2, rare 2/2) and brownish black to medium brownish gray and brown nahcolite. Very faint smooth to slightly distorted streaked bedding in oil shale. Fairly common fine to small coarse nahcolite blebs; some thin very fine grained stringers in lower part. Irregular thick parting; irregular to slightly conchoidal fracture. Common very fine disseminated crystals in oil shale.
2138.5	2140.5	Oil shale and nahcolite: dark to rare medium brownish gray oil shale (7.5YR 3/2, rare 4/2) and brownish black to some medium brown nahcolite. Very faint fairly smooth to distorted streaked bedding in oil shale. Fairly common very small to 3-inch coarsely crystalline nahcolite masses. Irregular thick parting; slightly irregular to irregular fracture. Fairly common very fine disseminated crystals.
2140.5	2142.9	Oil shale and rare nahcolite: dark brownish gray oil shale (7.5YR & 10YR 3/2). Very faint distorted to smooth streaked bedding. Irregular thick parting; slightly irregular to conchoidal fracture. Fairly common very fine disseminated crystals. Rare fine to small nahcolite blebs; common fine disseminated

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		nahcolite at 2142.0-2142.1 feet. Some brownish black slightly resinous material with common pyrite on parting surfaces at 2142.7 feet.
2142.9	2144.6	Oil shale and nahcolite: very dark brownish gray oil shale (10YR 2/2) and brownish black to some pale yellowish brown nahcolite. <u>Very</u> faint distorted to smooth streaked bedding in oil shale. Several large coarse radiating nahcolite nodules near top and a 5-inch very coarsely crystalline mass near base. Very irregular thick parting; very irregular to very conchoidal fracture. Some slightly curved vertical fractures with common very fine crystals in upper part. Some irregular mixed up core pieces in upper part.
2144.6	2145.7	Oil shale: very dark brownish gray and some black (10YR 2/2, some 1/2); some very slight satiny luster. Very faint smooth streaked bedding. Irregular thick parting; conchoidal to fairly smooth fracture. Rare very fine disseminated crystals.
		[ Sample of very dark brownish gray to black oil shale from 2145.5 feet: X-ray - quartz, dolomite, feldspar, dawsonite, ferroan?
2145.7	2148.0	Oil shale and nahcolite: medium brown to rare dark brownish gray and buff oil shale (10YR 4/3, rare 3/2 upper part, rare 5/3-7/2 lower part) and dark brown to tan and buff nahcolite. Very faint slightly distorted bedding in oil shale. Common fine streaks and stringers to 4-inch bands of fine grained nahcolite with common very fine interstitial oil-shale partings; some coarsely crystalline brownish black nahcolite in disseminated crystals, thin stringers, and rare small to large irregular masses. Irregular thick parting; irregular to some slightly conchoidal fracture. Some irregular mixed up core pieces near top.
		[ Sample of very faint bedded medium brown oil shale from 2146.7 feet: X-ray - quartz, dolomite, dawsonite; some feldspar, calcite.
2148.0	2149.0	Oil shale and nahcolite: medium brown to dark brownish gray oil shale (10YR & 7.5YR 4/3-3/2, rare 5/3 upper part) and dark brownish gray to some pale yellowish brown and rare brownish black nahcolite. Faint slightly distorted to smooth streaked bedding in oil shale. Common fine streaks and small blebs to 2-inch

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		bands of fine grained nahcolite with common very fine interstitial oil-shale partings; rare fine to small dark coarse nahcolite blebs. Slightly irregular to irregular thick parting; slightly irregular to irregular fracture.
2149.0	2153.0	Oil shale and some nahcolite: dark and rare medium brownish gray and brown oil shale (7.5YR & 10YR 3/2, rare 4/2-4/3 & 2/2). Faint fairly smooth streaked bedding. Irregular thick parting; slightly irregular and some slight hackly fracture. Common very fine disseminated crystals and fairly common pyrite. Common fine nahcolite blebs and rare small to 1-inch, coarse to fine crystalline masses.
2153.0	2154.0	Oil shale and nahcolite: dark brownish gray to medium brown and rare tan oil shale (10YR & 7.5YR 3/2-5/3, rare 6/3) and dark brownish gray to brownish black nahcolite. Faint fairly smooth streaked bedding in upper and lower parts; faint to fairly distinct, distorted to contorted streaks and stringers in middle. Common thin fine to medium crystalline nahcolite stringers, streaks, and small blebs in upper and lower parts; some 1- to 2-inch coarsely crystalline nodules in middle. Irregular thick parting; irregular fracture. Common very fine disseminated crystals.
2154.0	2156.0	Oil shale and nahcolite: dark to some medium brownish gray and rare brown to tan oil shale (10YR 3/2, some 4/2, rare 5/3-6/3) and dark brownish gray to brownish black nahcolite. Faint fairly smooth to distorted streaked bedding and rare distinct brown to tan stringers in oil shale. Common fine blebs and streaks to some thin irregular stringers and small patches of fine grained nahcolite; some small to 2-inch coarsely crystalline masses. Irregular thick parting; irregular fracture. Common very fine disseminated crystals.
2156.0	2158.4	Oil shale and nahcolite: medium to dark brownish gray and some brown to tan oil shale (10YR 4/2-3/2, some 5/3-6/3 lower part) and brownish black to dark brownish gray nahcolite. Faint distorted streaked bedding in oil shale; some moderately distinct streaks and stringers in lower part. Common fine blebs to 3-inch coarse nahcolite masses and some fine grained stringers. Irregular thick parting; irregular fracture. Common very fine disseminated crystals.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2158.4	2159.6	Nahcolite and oil shale: brownish black to dark brown nahcolite and dark brownish gray to medium brown and rare tan to buff oil shale (10YR 3/2-4/3, rare 5/3-6/3 & 7/2). Very common small to 5-inch, irregular to radiating coarsely crystalline nahcolite masses in distorted oil shale. Irregular parting and fracture.
2159.6	2160.7	Oil shale and some nahcolite: dark to rare medium brownish gray oil shale (10YR & 7.5YR 3/2, rare 4/2). Very faint fairly smooth to some distorted streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Some very small to 1-inch coarse nahcolite masses. Some very fine disseminated crystals and fine pyrite blebs.
2160.7	2161.7	Oil shale and nahcolite: dark brownish gray to medium brown oil shale (10YR & 7.5YR 3/2-4/3) and brownish black to pale yellowish brown and rare colorless nahcolite. Oil shale with faint distorted streaked bedding and some fine to small nahcolite masses in upper 0.4 foot. A single very coarse radiating nahcolite mass in lower part. <div style="margin-left: 40px;">Sample of very coarse brown to colorless nahcolite from 2161.5 feet: X-ray - nahcolite.</div>
2161.7	2162.8	Oil shale and nahcolite: dark and rare medium brownish gray oil shale (10YR 3/2, rare 4/2) and brownish black to dark brown nahcolite. Very faint fairly smooth laminae in oil shale; some very fine loop structures and displacements. A 5-inch very coarse radiating nahcolite mass at base (no nahcolite in upper part). Slightly irregular thick parting in oil shale; fairly smooth to some irregular fracture. A fine black pyritic stringer at top. Common very fine disseminated crystals in middle part.
2162.8	2164.0	Oil shale: dark brownish gray (10YR & 7.5YR 3/2). Very faint smooth streaked bedding and rare laminae. Irregular thick parting; irregular to slightly conchoidal fracture. Common very fine disseminated crystals in upper part.
2164.0	2165.0	Oil shale: dark brownish gray (10YR & 2.5Y 3/2). Very faint smooth streaked bedding. Irregular thick parting; irregular to conchoidal fracture. Rare very fine disseminated crystals. <div style="margin-left: 40px;">Sample of dark brownish gray oil shale from 2164.4 feet: X-ray - quartz, dolomite, dawsonite, feldspar, pyrite.</div>

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2165.0	2166.0	Oil shale: dark to medium brownish gray and brown (10YR & 7.5YR 3/2-4/2 & 4/3). Faint fairly smooth streaked bedding. Irregular thick parting; irregular to slightly conchoidal fracture. Rare small nahcolite masses and very small hackly pyrite blebs with nahcolite centers.
2166.0	2167.2	Oil shale and nahcolite: dark brownish gray to medium brown oil shale (10YR & 7.5YR 3/2-4/2 & 4/3, some 5/3 upper part) and brownish black to dark brown nahcolite. Fairly distinct to very faint, distorted to some smooth streaked bedding in oil shale. Common small to 4-inch coarsely crystalline nahcolite masses. Very irregular parting and fracture. Common very fine disseminated crystals in oil shale.
2167.2	2168.2	Oil shale: medium to dark brownish gray and brown (10YR & 7.5YR 4/2 & 4/3-3/2). Faint slightly distorted to smooth streaked bedding. Irregular thick parting; slightly irregular to hackly fracture. Fairly common very fine disseminated crystals. Some small coarse nahcolite blebs in upper part. Sample of brown hackly shale with very fine disseminated crystals from 2167.9 feet; X-ray - dolomite, quartz, feldspar, dawsonite, calcite.
2168.2	2170.2	Oil shale and nahcolite: medium brown to dark brownish gray oil shale (10YR & 7.5YR 4/3-3/2, rare 5/3 upper part) and brownish black to some pale brown nahcolite. Very faint distorted streaked bedding in oil shale. Some small to 3-inch, fine to coarse crystalline nahcolite masses in upper part; very common small to 4-inch, very coarse to rare medium and fine crystalline nahcolite masses in lower part. Irregular parting and fracture.
2170.2	2171.0	Missing.
2171.0	2173.0	Oil shale and nahcolite: dark brownish gray and some medium brown oil shale (10YR & 7.5YR 3/2, some 4/3 upper part, rare 2/2) and brownish black to some pale brown nahcolite. Very faint distorted streaked bedding in oil shale. Common small to 8-inch, coarse to medium crystalline nahcolite masses in upper part; common thick to thin, medium to fine grained stringers with common fine shale partings in lower part. Irregular thick parting; irregular to fairly regular fracture. Common very fine disseminated crystals--especially in lower part.

Illustration No. SBR-4052P (Sheet 125 of 212)

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of medium to fine grained nahcolite with some fine shale partings from 2172.4 feet: X-ray - nahcolite, dolomite, quartz, feldspar, dawsonite.
2173.0	2179.0	Oil shale: dark brownish gray (10YR 3/2-2/2). Very faint smooth streaked bedding. Irregular to slightly irregular thick parting; slightly irregular and rare slight hackly fracture. Very common very fine disseminated dawsonite(?) and pyrite. Rare very thin fine grained streaks (nahcolite?).
		Sample of oil shale with very common dawsonite (?) and pyrite from 2177.3 feet: X-ray - quartz, dawsonite, dolomite, feldspar, ferroan, pyrite.
2179.0	2180.0	Oil shale and nahcolite: Dark brownish gray oil shale as above. A thick band of dark brownish gray very fine grained nahcolite with common fine irregular shale partings at 2179.3-2179.8 feet.
2180.0	2181.0	Oil shale: very dark brownish gray to rare medium brown (10YR 3/2-2/2, rare 4/3 lower part). Very faint smooth streaked bedding; a 1/2- to 1-inch stringer of faintly laminated brown to brownish gray oil shale near base (unconformable contacts at top and bottom). Irregular thick parting; irregular to fairly regular fracture. Very common very fine disseminated dawsonite. Rare small coarse nahcolite blebs in upper part.
2181.0	2182.0	Oil shale and nahcolite: dark to medium brownish gray and brown oil shale (10YR & 7.5YR 3/2-4/2 & 4/3) and dark brownish gray to brownish black nahcolite. Faint distorted streaks and stringers in oil shale. A 2-1/2-inch stringer of fine grained nahcolite at 2181.6 feet; a 2-inch coarse radiating nodule at base; some fine blebs and streaks in other parts. Irregular thick parting; irregular fracture.
2182.0	2183.0	Oil shale and some nahcolite: dark to medium brownish gray oil shale (10YR 3/2-4/2). Faint smooth to some distorted streaked bedding. Irregular thick parting; slightly conchoidal to irregular fracture. Some 1- to 2-inch coarsely crystalline nahcolite masses in lower 0.4 foot.
2183.0	2185.0	Oil shale: medium to dark brownish gray and some brown (10Yr 4/2-3/2, some 4/3-5/3 lower part). Faint to some moderately distinct smooth laminae and streaked bedding; some very fine loop structures

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		and displacements. Irregular to fairly regular, thick to medium parting; slight hackly to some fairly regular fracture. Very common very fine disseminated crystals and crystalline streaks. A very fine nahcolite-filled vertical fracture from 2183.3 to 2183.6 feet. A 2-inch coarse nahcolite mass with pyritic rims at base.
2185.0	2186.0	Oil shale and some nahcolite: medium to dark brownish gray and some brown oil shale (10YR 4/2 & 3/2, some 4/3). Faint smooth to distorted streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Common very fine disseminated crystals. Rare fine pyrite blebs. A 3-1/2-inch coarse irregular nahcolite mass with common fine interstitial shale partings near base.
2186.0	2187.9	Oil shale and nahcolite: dark to medium brownish gray oil shale (10YR & 7.5YR 3/2-4/2, rare 2/2) and brownish black to dark brown nahcolite. Very faint distorted streaked bedding in oil shale. Very common small to 3-inch coarse irregular nahcolite masses; a 3/4-inch medium grained stringer at 2186.9 feet. Irregular parting and fracture. Common very fine disseminated crystals in oil shale.
2187.9	2188.7	Oil shale and nahcolite: dark brownish gray to brown and some tan oil shale (10YR & 7.5YR 3/2-4/3, some 5/3-6/3) and dark brown to tan and rare brownish black nahcolite. Fairly distinct distorted to smooth laminae in oil shale. A 3-1/2-inch band of fine grained nahcolite with some fine very irregular shale stringers near top (very irregular contact at top, and fairly regular contact at base); some small to 1-inch coarse masses in lower part. Irregular to slightly irregular thick parting; irregular to slightly conchoidal and rare hackly fracture. Common very fine disseminated crystals in oil shale. Some very fine short nahcolite-filled vertical fracture. A few very thin dense brownish gray dolomite(?) streaks and stringers in middle part.
2188.7	2189.6	Oil shale; dark brownish gray to medium brown and rare tan (10YR & 7.5YR 3/2-4/2 & 4/3, rare 5/3-7/3). Faint to fairly distinct smooth laminae; some fine loop structures and displacements. Slightly irregular thick to medium parting; fairly regular to some slight hackly fracture. Common very fine disseminated crystals.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2192.0	2194.4	Oil shale and some nahcolite: dark to medium brownish gray and brown oil shale (10YR & 7.5Y 3/2-4/2 & 4/3, rare 5/3 lower part). Faint distorted to smooth streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Some fine nahcolite blebs and rare small to 2-inch, irregular to radiating masses; 2-inch bands of very fine grained nahcolite at top and at 2193.1 feet. Common very fine disseminated crystals.
2194.4	2196.0	Oil shale and some nahcolite: dark brownish gray to medium brown oil shale (10YR & 7.5YR 3/2-4/3, very rare 5/3 upper part). Faint distorted streaked bedding. Irregular thick to medium parting; irregular fracture. Some fine blebs to rare 1- and 2-inch coarse nahcolite masses. Common very fine disseminated crystals. Some very fine disseminated pyrite.
2196.0	2199.0	Oil shale and some nahcolite: dark to medium brownish gray and brown oil shale (7.5YR & 10YR 3/2-4/2 & 4/3). Faint distorted to fairly smooth streaked bedding. Irregular thick to medium parting; irregular and rare coarse hackly fracture. Common fine nahcolite streaks and blebs; rare small to 2-inch coarse masses. Common very fine disseminated crystals.
2199.0	2201.0	Oil shale and nahcolite: medium to some dark brownish gray and brown oil shale (7.5YR & 10YR 4/2-4/3, some 3/2), and brownish black to dark brown nahcolite. Very faint fairly smooth to distorted streaked bedding in oil shale. Common fine nahcolite blebs and small to 3-inch coarsely crystalline masses. Irregular thick parting; irregular and rare coarse hackly fracture. Common very fine disseminated crystals. Sample of oil shale with fine nahcolite blebs and very fine disseminated crystals from 2200.6 feet: X-ray - dolomite, quartz, dawsonite, feldspar nahcolite, pyrite.
2201.0	2203.5	Oil shale and some nahcolite: medium to rare dark brownish gray and brown oil shale (10YR & 7.5YR 4/2-4/3, rare 3/2). Faint distorted to smooth streaked bedding; some faint laminae with fine loop structures and displacements in lower part. Irregular thick parting; irregular and some coarse hackly fracture.

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Laramie Petroleum Research Center, Laramie, Wyoming

April 6, 1967

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

Cannon-Fuels Branch  
U. S. Geological Survey  
Bldg. 25, Denver Federal Cen  
Denver, Colorado

From	To	Description
		Some fine to small nahcolite blebs; a 3-inch very irregular coarsely crystalline nahcolite mass at 2201.6 feet; a 2-inch mass with some very coarse colorless transparent crystals at 2202.8 feet. Common very fine disseminated crystals.
2203.5	2212.9	Oil shale: dark brownish gray (10YR 3/2); some fine black resinous to waxy streaks. Faint smooth and rare distorted streaked bedding. Irregular thick parting; regular to slightly conchoidal and some irregular fracture. Fairly common very fine disseminated crystals in upper part to rare in lower part. A 5-inch coarse radiating nahcolite mass at 2205.9 feet; no nahcolite in other parts. A large (1-inch high X 2+-inches long) irregular brown oil shale (?) inclusion in conformably deformed bedding at 2211.4 feet. Unconformable contact with rich oil shale below. <div style="margin-left: 40px;">Sample of oil shale with rare very fine disseminated crystals from 2207.9 feet: X-ray - quartz, dolomite, dawsonite, feldspar, pyrite.</div> <div style="margin-left: 40px;">Sample of large brown inclusion from 2211.4 feet: X-ray - dolomite; trace dawsonite, quartz, calcite.</div>
2212.9	2214.0	Oil shale and some nahcolite: dark brownish gray to black oil shale (10YR 3/2-1/2); very common satiny to resinous luster, some waxy luster in upper and lower parts. Faint slightly curved and some very distorted to fairly smooth and flat laminae with common fine to small loop structures in upper and lower parts; very faint distorted streaked bedding in middle. Fairly regular and wavy to irregular thick parting; conchoidal to irregular fracture. Some large irregular coarsely crystalline nahcolite masses at 2213.2-2213.4 feet. <div style="margin-left: 40px;">Sample of dark brownish gray to black, resinous to waxy shale from 2213.1 feet: X-ray - quartz, dolomite, dawsonite, feldspar, pyrite, calcite?</div>
2214.0	2216.1	Oil shale: dark brownish gray (10YR 3/2-2/2). Faint fairly smooth streaked bedding and some laminae; rare fine loop structures. Irregular thick parting; slightly irregular and conchoidal fracture. Common <u>very</u> fine disseminated crystals.

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Laramie Petroleum Research Center, Laramie, Wyoming

April 6, 1967

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2216.1	2217.1	Oil shale: dark to medium brownish gray (10YR & 2.5Y 3/2-4/2, some 2/2 upper part), medium brown to tan at 2216.6-2216.7 feet (10YR & 7.5YR 4/3-6/3). Faint distorted to fairly smooth streaked bedding. Irregular thick parting; slightly irregular and rare coarse hackly fracture. A 1/8-inch to very fine nearly vertical nahcolite-filled fracture at 2216.5-2216.8 feet (mostly restricted to unsampled 1/4 of core).
2217.1	2218.3	Oil shale: medium brownish gray in upper half (10YR & 2.5Y 4/3-5/3) and medium brown in lower half (10YR & 7.5YR 4/3). Faint smooth to slightly distorted streaked bedding. Irregular thick parting; slightly irregular to slight hackly fracture. Some very fine disseminated crystals and fine crystalline blebs and streaks. Sample of brown shale with some fine crystalline blebs and streaks from 2217.8 feet: X-ray - dolomite, quartz, feldspar, dawsonite.
2218.3	2220.4	Oil shale: medium to some dark brownish gray, rare medium brown to tan upper part (10YR 4/2, some 3/2, rare 5/3-6/3 upper part). Faint to very faint, distorted to smooth streaked bedding. Irregular thick parting; irregular and slight to coarse hackly fracture. Some to rare very fine disseminated crystals and crystalline patches. Rare very fine black pyritic streaks and stringers in upper part.
2220.4	2221.5	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, rare 2/2). Faint distorted streaked bedding in upper part to very faint smooth laminae in lower part; some fine loop structures in lower part. Irregular thick parting; irregular to conchoidal fracture. Some fine crystalline blebs and patches and black pyritic stringers at 2220.6-2220.8 feet.
2221.5	2222.5	Oil shale: dark and some medium brownish gray (10YR 3/2, some 4/2 & 2/2). Very faint smooth laminae; common fine loop structures. Slightly irregular to irregular thick parting; slightly irregular fracture. Rare <u>very</u> fine disseminated crystals.
2222.5	2224.5	Oil shale: medium to dark brownish gray and some black (10YR 4/2-3/2, some 2/2-1/2); very common satiny to resinous and rare waxy luster. Faint slightly distorted laminae; very common fine to small loop structures. Irregular to slightly irregular thick parting; slightly irregular to irregular fracture.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMine s-AEC Colorado Corehole No. 1--Continued

From	To	Description
2224.5	2226.5	Oil shale: dark to rare medium brownish gray and black (10YR 3/2-2/2, rare 4/2 & 1/2); some slight satiny luster, rare resinous luster near top. Faint slightly distorted laminae to very faint smooth streaked bedding; common fine loop structures and displacements near top. Irregular thick parting; slightly irregular to irregular fracture.
2226.5	2228.5	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, rare 2/2 upper part). Faint fairly smooth streaked bedding. Irregular thick parting; slightly irregular fracture. Rare fine brown to tan streaks and small inclusions.
2228.5	2229.5	Oil shale and nahcolite: dark brownish gray oil shale in upper part to medium brown in lower part (10YR 3/2-4/3, rare 2/2 upper part) and brownish black to some pale yellowish brown and colorless nahcolite. Very faint distorted streaked bedding in oil shale in upper part to massive in lower part. Common very small to large very irregular coarsely crystalline nahcolite masses. Irregular parting and fracture.
2229.5	2231.0	Oil shale and nahcolite: medium brown oil shale (10YR 4/3-5/3) and brownish black to dark brown and rare pale brown to colorless nahcolite. <u>Very</u> faint distorted bedding in oil shale. Common small to 4-inch, irregular to radiating coarsely crystalline nahcolite masses. Irregular thick parting; slightly conchoidal to irregular fracture. (Footage adjustment--interval is actually 1.8 feet long).
2231.0	2232.4	Oil shale and some nahcolite: medium to some dark brown and brownish gray oil shale (10YR 4/3-4/2, some 3/2, rare 5/3-5/2 upper part); some very fine satiny to resinous black streaks. Moderately distinct to faint, slightly distorted to smooth streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. A 2-inch irregular coarse nahcolite mass 2231.5 feet; rare very small blebs in other parts.
2232.4	2233.6	Oil shale and rare nahcolite: medium to rare dark brown and brownish gray oil shale (10YR 4/3 & 4/2-5/3, rare 3/2). Faint slightly distorted streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Rare very small to 1-inch nahcolite blebs.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-APC Colorado Corehole No. 1--Continued

From	To	Description
2233.6	2235.1	Oil shale and nahcolite: medium to some dark brown and brownish gray oil shale (10YR 4/3 & 4/2-5/3, some 3/2) and brownish black to dark brown nahcolite. Faint distorted to fairly smooth streaked bedding in oil shale. Some large (up to 3-inch) coarse nahcolite masses. Irregular thick parting; irregular to fairly regular fracture.
2235.1	2236.1	Oil shale and some nahcolite: medium to very rare dark brown and brownish gray oil shale (10YR 4/3 & 4/2-5/3, rare 3/2). Very faint to faint, fairly smooth to distorted streaked bedding. Irregular thick parting; fairly regular to some irregular fracture. A 3-inch coarse nahcolite mass at 2235.7 feet (almost none in sampled 1/4 of core).
2236.1	2237.1	Oil shale and nahcolite: medium to dark brownish gray and brown oil shale (10YR & 7.5YR 4/2 & 4/3-3/2) and brownish black to dark and rare pale brown nahcolite. Very faint distorted bedding in oil shale; 2-inch coarsely crystalline radiating nahcolite masses at 2236.2 and 2236.6 feet; an irregular 2-inch coarse to medium crystalline stringer (?) at base. Irregular thick parting; conchoidal to irregular fracture.
2237.1	2250.0	Oil shale: dark brownish gray (10YR & 7.5YR 3/2); common fine satiny to waxy black streaks--especially in upper half. Faint slightly distorted to smooth streaked bedding. Irregular to slightly irregular thick parting; slightly irregular fracture. Rare fine nahcolite (?) blebs at 2242.1 feet. A very irregular thin black pyritic stringer with <u>very</u> fine lath-shaped dawsonite crystals at 2249.0 feet.
2250.0	2252.0	Oil shale: dark brownish gray (10YR 3/2); some slight satiny luster lower part. Very faint fairly smooth streaked bedding; rare loop structures. Slightly irregular to irregular thick parting; slightly irregular to irregular fracture. Some <u>very</u> fine disseminated crystals. Some fine lacy black pyritic streaks and stringers at 2250.1 and 2250.5 feet.
2252.0	2254.0	Oil shale: dark brownish gray (10YR & 7.5YR 3/2, some 2/2); very common satiny to resinous luster. Very faint fairly smooth streaked bedding. Slightly irregular to irregular thick parting; irregular fracture. Common very fine disseminated crystals and crystalline streaks in lower 0.2 foot.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2254.0	2257.0	Oil shale: very dark brownish gray, some black in upper part (10YR & 7.5YR 2/2-3/2, some 1/2 upper part). Very faint smooth streaked bedding. Irregular to slightly irregular thick parting; slightly irregular and conchoidal fracture. Common very fine disseminated crystals--especially in upper 0.5 foot. A very thin black stringer with common very fine brownish gray to buff plates (shell fragments?) at 2255.2 feet. <div style="margin-left: 40px;">Sample of dark brownish gray to black shale with common very fine dawsonite from 2254.2 feet: X-ray - quartz, feldspar, dawsonite, dolomite, pyrite.</div>
2257.0	2262.0	Oil shale: dark brownish gray (10YR 3/2-2/2); some very slight satiny luster. Very faint smooth streaked bedding. Slightly irregular to irregular thick parting; slightly irregular to irregular fracture. Fairly common very fine disseminated crystals.
2262.0	2263.3	Oil shale: dark to medium brownish gray and brown, some fine tan to buff streaks and inclusions in lower part (10YR 2/2-4/2 & 4/3, some 5/3-6/3 & 7/2); some slight satiny to rare resinous and waxy luster. Very faint to some fairly distinct, smooth to distorted streaked bedding. Irregular thick parting; irregular fracture. Rare fine nahcolite blebs near base.
2263.3	2264.3	Oil shale and nahcolite: dark brownish gray to medium brown oil shale (10YR 3/2-4/3, rare 2/2) and dark brown to pale yellow nahcolite. Very faint distorted bedding in oil shale; some resinous luster. Medium grained nahcolite with common fine interstitial shale partings from 2263.4 to 2264.1 feet. Irregular parting and fracture.
2264.3	2265.3	Oil shale and nahcolite: medium brown and some dark brownish gray oil shale (10YR 4/3-5/3, some 2/2) and brownish black to some pale yellow and colorless nahcolite. Very faint distorted streaked bedding in oil shale. Some very large (up to 6-inch) irregular coarse nahcolite masses. Irregular parting and fracture.
2265.3	2267.4	Oil shale and nahcolite: medium brown and rare dark brownish gray oil shale (10YR 5/3-4/3, rare 3/2) and dark brown to very pale grayish yellow nahcolite. Very faint distorted to smooth streaked bedding and some faint laminae in oil shale. Common thick (up to 5-inch) bands of medium to fine grained nahcolite with common very fine interstitial shale partings. Irregular thick parting; slightly irregular to irregular fracture.

## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2267.4	2274.0	Oil shale and some nahcolite: dark brownish gray oil shale (10YR & 7.5YR 3/2). Very faint smooth to some distorted streaked bedding. Slightly irregular to irregular thick parting; slightly irregular fracture. Some small to 3-inch, fine to coarse nahcolite masses in intervals 2268.5-2270.0 and 2271.0-2273.0 feet; rare small blebs in other parts. Rare very fine resinous to vitreous black organic streaks in lower part (fossil fragments?).
2274.0	2276.0	Oil shale: dark brownish gray (10YR 3/2, some 3/1 lower part). Very faint very smooth streaked bedding. Irregular thick parting; slightly irregular and conchoidal fracture. Common <u>very</u> fine disseminated crystals.
2276.0	2277.0	Oil shale: dark to medium brownish gray and brown (10YR 3/2-4/2 & 4/3, some 3/1, rare 2/2); some resinous to waxy luster. Very faint to faint smooth laminae and streaked bedding; some loop structures. Slightly irregular to irregular thick parting; slightly irregular to some slight hackly fracture. Some <u>very</u> fine disseminated crystals.
2277.0	2278.0	Oil shale: dark to some medium brownish gray (10YR 3/2-3/1, some 4/2-4/1). Very faint smooth laminae and streaked bedding. Irregular to some fairly regular thick parting; slightly irregular and some slight hackly fracture. Some <u>very</u> fine disseminated crystals. Some fine dark gray to black pyritic laminae near top; rare fine black discolored streaks in lower part.
2278.0	2280.7	Oil shale: medium to some dark brown and brownish gray, rare black (10YR 4/3 & 4/2, some 3/2, rare 2/2-1/2, some 2.5Y 5/2-3/2 lower part); some satiny to waxy luster at 2278.0-2278.7 and 2279.8-2280.2 feet. Faint to very faint, smooth to some distorted laminae and streaked bedding; very common fine to small loop structures. Irregular thick parting; slightly irregular fracture. Very rare fine vitreous black organic blebs and streaks. Some distinct tan to buff marlstone streaks and laminae near base.
2280.7	2285.0	Oil shale: dark and rare medium brownish gray (10YR 3/2, rare 4/2). Very faint smooth to rare distorted streaked bedding. Irregular thick parting; slightly irregular fracture. Some very irregular coarsely crystalline nahcolite masses on edge of core in lower 1/2 foot.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2285.0	2286.0	Oil shale and nahcolite: dark brownish gray to medium brown oil shale (10YR 3/2-4/3) and brownish black to pale yellowish brown nahcolite. Oil shale with very faint distorted streaked bedding at top and bottom. Coarsely crystalline nahcolite with common fine interstitial shale partings from 2285.2 to 2285.8 feet. Irregular parting and fracture.
2286.0	2287.3	Oil shale: medium brown with some very fine dark brownish gray streaks (10YR 4/3, some 3/2). Very faint slightly distorted streaked bedding. Irregular thick parting; slightly irregular fracture.
2287.3	2288.5	Oil shale and some nahcolite: dark to medium brownish gray and brown oil shale (10YR 3/2-4/2 & 4/3, some 2/2 upper part). Very faint smooth and some distorted streaked bedding. Irregular thick parting; slightly irregular fracture. A 2-inch coarse radiating mass at 2288.3 feet. Very common very fine disseminated crystals.
2288.5	2289.6	Oil shale and rare nahcolite: dark brownish gray oil shale (10YR 3/2, some 2/2). Very faint slightly distorted streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Very common very fine disseminated crystals. A 1-inch radiating nahcolite mass at 2288.9 feet; a very small nahcolite bleb at 2289.4 feet (almost none in sampled 1/4 of core).
2289.6	2290.8	Oil shale and rare nahcolite: medium brown to dark brownish gray oil shale (10YR 4/3-3/2, some 2/2 lower part). Very faint distorted to fairly smooth streaked bedding. Irregular thick parting; irregular to slightly conchoidal fracture. Common very fine disseminated crystals. A thin fine grained nahcolite stringer with very pyritic rims at 2290.0 feet; a 2-inch coarse mass at 2290.2 feet.
2290.8	2291.0	Missing
2291.0	2294.1	Oil shale and some nahcolite: dark brownish gray oil shale (10YR 3/2-2/2). Very faint smooth and rare distorted streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Very common very fine disseminated crystals. Common irregular moderately coarse crystalline nahcolite masses and disseminated

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		crystals at 2292.0-2292.3 and 2293.8-2294.1 feet; common dark gray pyritic rims and stringers.
		Sample of oil shale with common very fine disseminated crystals from 2291.7 feet:
		X-ray - quartz, dolomite, feldspar; some dawsonite, pyrite, ferroan?
2294.1	2296.1	Oil shale: dark brownish gray and some medium brown (10YR & 7.5YR 3/2-2/2, some 4/3). Faint to very faint fairly smooth streaked bedding. Irregular thick parting; irregular to slightly conchoidal fracture. Very common very fine disseminated crystals.
2296.1	2297.1	Oil shale: dark brownish gray (10YR & 7.5YR 3/2-2/2). Very faint smooth streaked bedding. Irregular to slightly irregular thick parting; slightly conchoidal fracture. A very irregular 1-inch pyrite mass with some coarse nahcolite crystals at 2296.6 feet.
2297.1	2298.1	Oil shale: very dark brownish gray to black (10YR & 7.5YR 2/2-1/2, rare 3/2). Very faint smooth streaked bedding. Irregular to slightly irregular thick parting; fairly smooth fracture.
2298.1	2299.6	Oil shale: dark to medium brownish gray and brown (10YR & 7.5YR 3/2-4/2 & 4/3). Very faint smooth streaked bedding. Slightly irregular to irregular thick parting; slightly irregular and some slight hackly fracture. Common very fine disseminated crystals.
2299.6	2302.1	Oil shale and nahcolite: medium brown to rare dark brownish gray and tan oil shale (10YR 4/3 & 4/2-5/3 & 5/2, rare 3/2 & 6/3) and brownish black to rare pale brown nahcolite. Faint distorted to fairly smooth streaked bedding in oil shale. Very large coarsely crystalline nahcolite masses with fine interstitial shale partings at 2299.6-2300.6, 2301.1-2301.3 and 2301.5-2302.0 feet; some small to 2-inch masses in other parts. Irregular thick to medium parting and slight hackly fracture in oil shale. Common very fine disseminated crystals. Some very irregular thin dark gray to black pyritic stringers at 2306.5-2306.7 feet.
		Sample of oil shale with black pyritic stringers from 2306.6 feet:
		X-ray - pyrite, dawsonite, quartz, dolomite.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMinas-AEC Colorado Corehole No. 1--Continued

From	To	Description
2307.0	2310.0	Oil shale: dark and very rare medium brownish gray (10YR & 7.5YR 3/2, rare 4/2). Very faint smooth to some distorted streaked bedding. Irregular thick parting; slightly irregular fracture. Very irregular thin to fine dark gray to black pyritic stringers with some pale yellowish green stains at 2309.0 and 2309.8 feet.
2310.0	2311.0	Oil shale: dark brownish gray (10YR & 7.5YR 3/2, rare 2/2). Very faint contorted to smooth streaked bedding. Irregular thick parting; irregular coarse hackly fracture. Some very irregular fine black pyritic stringers in upper part.
2311.0	2315.6	Oil shale: dark brownish gray (10YR 3/2, rare 2/2). Very faint smooth streaked bedding. Irregular to slightly irregular thick parting; slightly irregular and some coarse hackly fracture. Rare fine brown lenses and streaks.
2315.6	2318.8	Oil shale: very dark brownish gray (10YR 2/2). Very faint very smooth streaked bedding. Slightly irregular thick parting; smooth to slightly conchoidal fracture. <div style="margin-left: 40px;">Sample of oil shale from 2317.2 feet: X-ray - quartz, dawsonite, feldspar, dolomite, pyrite, ferroan?</div>
2318.8	2319.8	Oil shale: dark brownish gray (10YR 2/2-3/2). Very faint smooth streaked bedding and rare laminae. Slightly irregular to irregular thick parting; slightly irregular to very coarse hackly fracture.
2319.8	2320.8	Oil shale: medium to some dark brownish gray and brown (10YR & 2.5Y 4/2 & 4/3-5/2 & 5/3, some 3/2); rare slight satiny luster. Faint slightly distorted streaked bedding. Irregular thick parting; slight hackly fracture. Rare fine crystalline blebs and streaks.
2320.8	2323.7	Oil shale: medium brown to tan and very rare dark brownish gray (10YR & 2.5Y 5/3-6/3, some 4/3, rare 3/2 upper part). Moderately distinct to faint, smooth to slightly distorted streaked bedding and rare laminae. Irregular thick parting; slightly irregular to slight hackly fracture. Some fine crystalline streaks and very small irregular patches. <div style="margin-left: 40px;">Sample of brown oil shale with small crystalline patches from 2322.1 feet: X-ray - dolomite, quartz, dawsonite, feldspar.</div>

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Laramie Petroleum Research Center, Laramie, Wyoming

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2323.7	2325.3	Oil shale: dark and some medium brownish gray and brown (10YR & 7.5YR 3/2, some 4/3-4/2). Very faint fairly smooth streaked bedding; rare distinct fine tan streaks and stringers in upper part. Irregular thick parting; slight to fairly coarse hackly fracture. Fairly common fine crystalline streaks, blebs, and very fine disseminated crystals. A 3/4- X 1-1/2-inch angular buff marlstone inclusion at 2324.7 feet.
2325.3	2327.6	Oil shale: dark brownish gray to some black (10YR & 7.5YR 3/2-2/2, some 1/2). Very faint smooth to some distorted streaked bedding. Irregular to some fairly regular thick parting; slightly irregular to irregular fracture. Some fine crystalline streaks, blebs, and disseminated crystals.
2327.6	2329.8	Oil shale: dark and rare medium brownish gray to some black (10YR 3/1 & 3/2-2/2, rare 4/1-4/2 upper part; 2/2, some 3/1 & 1/2 lower part). Very faint very fine smooth laminae and streaked bedding. Slightly irregular to very regular, thick to medium parting; slight to some fairly coarse hackly fracture. Very common very fine crystalline streaks and disseminated crystals (dawsonite). A tight vertical fracture with slight brownish black resinous coatings from 2327.8 to 2328.3 feet. <div style="margin-left: 40px;">Sample of oil shale with common dawsonite from 2329.5 feet:  X-ray - quartz, dawsonite, dolomite, feldspar, pyrite, illite, ferroan?</div>
2329.8	2332.0	Oil shale: dark brownish gray and some black (10YR 3/2-2/2, some 1/2 near top and bottom). Very faint smooth streaked bedding and some very fine laminae; some fine loop structures and displacements. Slightly irregular thick parting; slightly irregular and conchoidal to some coarse hackly fracture. Very rare fine vitreous black organic streaks in upper part. <div style="margin-left: 40px;">Sample of dark brownish gray to black oil shale without visible dawsonite from 2330.0 feet:  X-ray - quartz, dolomite, feldspar, dawsonite, pyrite, illite, ferroan?</div>
2332.0	2333.4	Oil shale: dark brownish gray and very rare medium brown (10YR 3/2-2/2, rare 7.5YR 3/2-4/3); very common slight satiny to rare resinous luster.

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LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMinas-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Very faint slightly distorted to smooth laminae and streaked bedding; common fine to small loop structures in upper part. Irregular thick parting; irregular slight to coarse hackly fracture.
2333.4	2334.8	Oil shale: dark brownish gray (10YR & 2.5Y 3/2, rare 2/2); common slight satiny luster. Very faint smooth to some slightly distorted streaked bedding. Irregular thick parting; irregular slight to rare coarse hackly fracture. Rare very fine disseminated crystals and crystalline streaks. Rare fine to small dense brown to tan streaks and lenses in lower part.
		Sample of shale with some very fine disseminated crystals and rare fine dense brown lenses from 2334.1 feet:
		X-ray - quartz, dolomite, feldspar, dawsonite, illite, pyrite, ferroan?
2334.3	2335.9	Oil shale: medium to some dark brownish gray and brown (7.5YR & 10YR 4/2-4/3, some 2.5Y 3/2 lower part); very rare satiny to resinous luster. Very faint smooth to distorted streaked bedding; very irregular stringers and inclusions with unconformable internal laminae in lower 0.3 foot. Irregular thick parting; slight to coarse hackly and some irregular fracture. Rare to fairly common very fine disseminated crystals. Rare fine dense to crystalline blebs in upper part.
2335.9	2337.0	Oil shale: dark and rare medium brownish gray to some black (7.5YR & 10 YR 3/2-2/2, some 1/2, rare 4/2 lower part). Very faint smooth streaked bedding to faint and rare moderately distinct slightly distorted laminae; some fine to small irregular loop structures in lower part. Irregular thick parting; fairly regular to irregular and some slight to coarse hackly fracture. Common very disseminated crystals and some fine crystalline blebs and streaks (dawsonite).
2337.0	2339.0	Oil shale: very dark brownish gray to some black (10YR 2/2, some 1/2, rare 3/2). Very faint smooth streaked bedding. Slightly irregular to very regular, thick to medium and rare thin parting; slight hackly to fairly smooth fracture. Very common very fine disseminated crystals and crystalline streaks (dawsonite)--decreasing in size and abundance toward base.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2339.0	2340.0	Oil shale: dark brownish gray (10YR 2/2-3/2 & 3/1). Very faint smooth laminae and streaked bedding. Regular to some irregular, thick to medium parting; slightly conchoidal to irregular fracture. Some irregular mixed up core pieces in middle part.
2340.0	2346.0	Oil shale: dark brownish gray (10YR 3/2, some 2/2). Very faint very smooth and rare slightly distorted laminae and streaked bedding. Regular to some irregular, thick to medium parting; fairly smooth and some very slight to rare coarse hackly fracture. Very common very fine disseminated crystals and crystalline streaks in intervals 2341-2343 and 2344-2346 feet; common <u>very</u> fine crystals and rare crystalline streaks in other parts.
2346.0	2349.0	Oil shale: very dark brownish gray (10YR 2/2, rare 3/2). Very faint very smooth streaked bedding. Regular to some irregular thick parting; smooth to conchoidal fracture. Common <u>very</u> fine disseminated crystals; some very fine crystalline streaks near top. A fine dark gray silty-textured lamina at 2347.8 feet.
2349.0	2351.0	Oil shale: dark brownish gray (10YR 2/2-3/2). Very faint smooth laminae and streaked bedding. Slightly irregular to irregular thick parting; conchoidal to smooth fracture. (Footage adjustment-- interval 2350.0-2351.0 is 1.6 feet long).
2351.0	2352.0	Oil shale: dark to some medium brownish gray (10YR 2/2-3/2, some 4/2 lower part). Very faint to faint smooth laminae and streaked bedding. Slightly irregular to irregular thick parting; fairly smooth to conchoidal fracture.
2352.0	2353.3	Oil shale: dark to medium brownish gray (10YR 2/2-4/2, rare 5/2). Faint smooth laminae and streaked bedding. Irregular thick parting; slightly irregular to irregular and conchoidal fracture. Some very fine pyrite blebs. Some tight vertical fractures with resinous black coating to very fine blebby black crusts.
2353.3	2357.4	Oil shale: dark to medium brownish gray (10YR 2/2-4/2). Faint smooth laminae and streaked bedding; some very fine loop structures and displacements. Irregular to some fairly regular thick parting; slightly irregular to irregular and conchoidal fracture. Rare short tight vertical fractures with brown to black resinous coatings

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		in upper part. Some very fine black pyritic streaks and blebs in middle part. A 1-inch medium brownish gray massive to very faintly bedded band at 2357.1 feet.
2357.4	2358.4	Oil shale: medium to rare dark brownish gray and brown (10YR 4/2-4/3, rare 3/2). Faint smooth to rare distorted laminae; common fine loop structures and displacements. Irregular thick parting; fairly regular to some irregular fracture. Some very irregular fine lacy black pyritic stringers in distorted shale at 2357.9-2358.0 feet.
2358.4	2359.9	Oil shale: dark to medium brownish gray (10YR 3/2-4/2). Very faint smooth laminae and streaked bedding. Slightly irregular to irregular thick parting; slightly irregular and conchoidal fracture. Rare fine black pyritic blebs in lower part.
2359.9	2361.1	Oil shale: medium to rare dark brownish gray (10YR 4/2, rare 3/2). Very faint smooth to slightly distorted and wavy laminae; very common fine loop structures. Irregular thick parting; slightly irregular to irregular and conchoidal fracture. Some very irregular thin to fine discontinuous black pyritic stringers in lower part--commonly with dense blebby brown to tan centers.
		[ Sample of thin brown to tan stringer with black pyritic rims from 2360.6 feet: X-ray - dolomite, ferroan, quartz, pyrite.
2361.1	2362.3	Oil shale: medium to rare dark brownish gray and brown (10YR 4/2-4/3, rare 3/2). Very faint smooth and some distorted laminae; some fine loop structures and displacements. Irregular thick parting; slightly irregular to irregular fracture. Some very irregular fine black pyritic stringers--rarely with dense brown material.
2362.3	2363.1	Marlstone and oil shale: buff to rare tan marlstone (10YR 7/2-8/2, rare 6/3) and medium to dark brownish gray oil shale (10YR 4/2-3/2). Marlstone with faint contorted and broken streaks and stringers to very faint bedding in upper and lower parts. Oil shale with very faint smooth to some distorted laminae from 2362.5 to 2362.8 feet; some tan laminae in irregular "horsetail flexures." Irregular thick parting; very irregular to some slightly irregular fracture. Some very irregular fine black pyritic stringers near top. Some <u>very</u> fine

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		short irregular nahcolite-filled fractures in marlstone at top; very common in lower marlstone.
		Sample of marlstone with very common fine nahcolite-filled fractures from 2362.9 feet: X-ray - dolomite, quartz, dawsonite, feldspar.
2363.1	2364.7	Oil shale and some marlstone: dark to light brownish gray and some buff (10YR 3/2 & 3/1-6/2, some 7/2). Very faint to some fairly distinct smooth laminae; light colors concentrated in thin to 2-inch zones; contorted stringers and displaced laminae in lower 0.3 foot. Regular to rare irregular, thick to some thin parting; slightly irregular to irregular fracture. Fairly common very fine short vertical nahcolite-filled fractures--mostly in lighter colored zones. Rare very fine black pyritic stringers and blebs.
2364.7	2366.5	Oil shale; medium to very rare light brownish gray (10YR 4/2, some 5/2, rare 6/2). Very faint to rare distinct smooth laminae; contorted laminae and stringers in lower 0.3 foot. Slightly irregular to irregular thick parting; slightly irregular to irregular fracture. Very rare very short tight nahcolite-filled vertical fractures. Common very irregular lacy black pyritic stringers with rare fine crystalline blebs in contorted shale at base.
		Sample of shale with lacy black pyritic stringers from 2366.3 feet: X-ray - quartz, dawsonite, pyrite; some feldspar, dolomite.
2366.5	2369.0	Oil shale: dark to medium brownish gray (10YR 3/2 & 3/1-4/2 & 4/1; some almost neutral gray). Very faint very smooth laminae and streaked bedding. Slightly irregular to very regular thick parting; fairly smooth to some irregular fracture. Some <u>very</u> fine disseminated crystals.
		Sample of dark brownish gray to almost neutral gray shale with very fine disseminated crystals from 2368.9 feet: X-ray - quartz, dawsonite, dolomite, feldspar, pyrite, ferroan?
2369.0	2370.2	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, rare 3/1 & 2/2); rare fine satiny to resinous streaks. Very faint smooth streaked bedding and rare laminae. Slightly irregular thick parting; smooth fracture. Some <u>very</u> fine disseminated crystals; rare fine crystalline streaks near base.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2370.2	2377.0	Oil shale and nahcolite: dark to medium brownish gray oil shale (10YR & 7.5YR 3/2-4/2) and brownish black to very dark brown nahcolite. Very faint smooth to some distorted laminae and streaked bedding in oil shale. Common 1- to 3-inch coarsely crystalline radiating nahcolite nodules; rare very small nahcolite blebs. Irregular thick parting; slightly irregular to irregular and conchoidal fracture. Rare fine satiny to resinous streaks near top. Some very fine black pyritic blebs at 2375.1 feet. Sample of dark brownish gray oil shale from 2371.1 feet: X-ray - quartz, dolomite, dawsonite, feldspar.
2377.0	2378.0	Oil shale and nahcolite: dark to rare medium brownish gray oil shale (10YR & 7.5YR 3/2, rare 4/2) and brownish black to medium brown nahcolite. Very faint distorted to smooth laminae and streaked bedding in oil shale. Common large coarse radiating to irregular nahcolite nodules; rare very fine grained massive stringers. Irregular thick parting; very irregular to conchoidal fracture. Sample of coarsely crystalline nahcolite from 2377.2 feet: X-ray - nahcolite, quartz, dolomite.
2378.0	2380.0	Oil shale and nahcolite: dark to rare medium brownish gray oil shale (10YR & 7.5YR 3/2 rare 4/2) and dark brown to buff and rare brownish black nahcolite. Very faint slightly distorted to smooth laminae and streaked bedding in oil shale. Common thin to 1-inch, dense to very fine crystalline nahcolite bands; rare 1- to 2-inch coarse radiation nodules. Irregular thick parting; slightly conchoidal to irregular fracture. Sample of very fine grained buff nahcolite from 2379.7 feet: X-ray - dolomite, quartz, nahcolite, calcite, dawsonite.
2380.0	2383.0	Oil shale and nahcolite: dark to some medium brownish gray oil shale (10YR & 7.5YR 3/2, some 4/2) and medium to light brownish gray and rare tan nahcolite. Very faint smooth to distorted streaked bedding in oil shale. Very common thin to 1-inch very fine grained nahcolite bands and stringers; rare small fine to moderately coarse grained blebs and stringers. Irregular thick parting; slightly irregular and conchoidal to very irregular fracture.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of dark brownish gray oil shale from 2380.4 feet: X-ray - quartz, dolomite, dawsonite, calcite, feldspar.
2383.0	2385.1	Oil shale and nahcolite: dark to some medium brownish gray oil shale (7.5YR & 10YR 3/2, some 4/2, rare 2/2) and medium to some light brownish gray and brown nahcolite. Very faint smooth to some distorted streaked bedding in oil shale; rare slight satiny luster. Common thin to 1-inch fine grained nahcolite bands and stringers; occasional small coarse nodules; a 6-inch very fine crystalline to dense nahcolite band at base. Irregular thick parting; irregular fracture. Fairly common <u>very</u> fine disseminated crystals.
		Sample of dense massive brown nahcolite from 2384.7 feet: X-ray - nahcolite, dolomite; some quartz, feldspar.
2385.1	2388.4	Oil shale and nahcolite: dark to medium brownish gray and brown oil shale (7.5YR & 10YR 3/2-4/2 & 4/3) and brownish black to some buff nahcolite. Faint fairly smooth to some distorted streaked bedding in oil shale. Common fine to rare coarse nahcolite in disseminated crystals, small blebs to large irregular masses, and thin to 1-inch irregular stringers. Irregular parting and fracture.
2388.4	2389.4	Oil shale and nahcolite: dark to medium brownish gray and brown oil shale (7.5YR & 10YR 3/2-4/2 & 4/3) and brownish black to dark brown and rare pale brown to colorless nahcolite. Faint distorted streaked bedding in oil shale. A very large irregular medium to coarse crystalline nahcolite mass with common fine interstitial shale partings in middle; common thin fine grained bands and stringers in upper and lower parts. Irregular parting and fracture.
2389.4	2391.0	Oil shale and nahcolite: dark brownish gray to medium brown oil shale (10YR & 7.5YR 3/2-4/3, rare 2/2 upper part) and brownish black to some medium brown nahcolite. Faint slightly distorted laminae to very faint very distorted streaked bedding in oil shale; some fine loop structures and displacements in upper part. Common thin to 1-inch fine grained nahcolite bands and stringers

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		in upper part; common large fine to coarse, irregular to radiating nahcolite masses in lower part. Irregular parting and fracture.
2391.0	2394.4	Oil shale and nahcolite: medium to rare dark brown oil shale (10YR & 7.5YR 4/3-4/4, rare 3/3 & 5/3) and brownish black to rare pale brown and colorless nahcolite. Faint to rare distinct very distorted streaks, stringers, and rare laminae in oil shale. Common large (up to 4-inch) coarse irregular to radiating nahcolite masses. Irregular parting and fracture.
2394.4	2400.0	Oil shale and some nahcolite: medium brown and rare brownish gray oil shale (10YR 4/3, rare 4/2-5/2). Faint fairly smooth to some distorted streaked bedding. Irregular to some slightly irregular thick parting; slightly irregular to irregular fracture. Fairly common to rare, fine to medium grained nahcolite in disseminated crystals, thin stringers, and fine blebs to rare large irregular masses; a 2-1/2-inch dark coarsely crystalline mass at 2395.9 feet and rare small to 1-inch coarse nodules in other parts. Rare very fine pyrite blebs and disseminated crystals.
		Sample of oil shale with fine nahcolite blebs and disseminated crystals from 2397.7 feet: X-ray - dolomite, quartz, dawsonite, feldspar; some nahcolite, calcite.
2400.0	2402.8	Oil shale and nahcolite: medium brown to brownish gray oil shale (10YR 4/3-4/2) and brownish black to dark brown nahcolite. Faint distorted to some fairly smooth streaked bedding in oil shale. Common small to large (up to 5-inch) coarse irregular to radiating nahcolite masses; rare irregular fine grained stringers and disseminated crystals in upper part. Irregular thick parting; irregular fracture.
2402.8	2404.2	Nahcolite: brownish black to some medium and rare pale brown. Coarse radiating to irregularly oriented crystals with common fine interstitial shale partings; some massive fine grained nahcolite in upper part (coarse radiating aggregates in fine grained matrix). Irregular parting and fracture.
		Sample of coarse radiating nahcolite crystals from 2403.0 feet: X-ray - nahcolite; trace quartz, feldspar?

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of fine grained nahcolite matrix from 2403.0 feet: X-ray - Nahcolite, some quartz.
2404.2	2405.7	Oil shale: medium to some dark brownish gray and brown (10YR 4/2-4/3, some 3/2, rare 5/2 upper part); rare fine satiny to resinous streaks. Faint to moderately distinct, distorted to some fairly smooth streaks and stringers. Irregular thick parting; slightly irregular to irregular fracture. Some very fine disseminated pyrite in upper part.
2405.7	2406.8	Oil shale and nahcolite; medium brownish gray to brown oil shale (10YR 4/2-4/3, rare 5/3) and brownish black to very dark brown nahcolite. Very faint and rare distinct, slightly distorted to contorted streaked bedding in oil shale. Some very large very irregular coarse nahcolite masses and rare small blebs. Very irregular parting and fracture.
2406.8	2408.1	Oil shale: medium and rare dark brownish gray (10YR 4/2, rare 5/2 & 3/2-2/2); some fine satiny to resinous streaks in lower part. Faint slightly distorted to some smooth streaked bedding; some laminae with rare loop structures in middle part. Irregular thick parting; slightly irregular to irregular fracture. Some very fine disseminated pyrite.
2408.1	2410.3	Oil shale and some nahcolite: medium to rare dark brownish gray and brown oil shale (10YR 4/2-4/3, rare 3/2 & 5/2); some fine satiny to resinous streaks. Faint slightly distorted streaked bedding. Irregular parting and fracture. A 3-inch moderately coarse nahcolite mass at top; a 2-inch very coarse mass with pyritic rims at base; rare fine blebs and small masses in other parts. Rare fine pyrite blebs.
2410.3	2411.0	Missing
2411.0	2414.0	Oil shale and nahcolite: medium to very rare dark brownish gray and brown oil shale (10YR 4/2-4/3, rare 3/2 upper and lower parts) and brownish black to dark brown nahcolite. Very faint distorted laminae and streaked bedding in oil shale. Very common small to 2-inch coarsely crystalline radiating nahcolite nodules. Irregular thick parting; irregular to some slightly irregular and conchoidal fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2414.0	2415.0	Oil shale and nahcolite: medium to rare light and dark brownish gray oil shale (10YR 4/2-5/2, rare 6/2 & 3/2) and brownish black to dark brown nahcolite. Faint to moderately distinct very distorted streaks and some laminae in oil shale. Very common 1- to 2-inch coarse radiating nahcolite nodules; some irregular fine to medium grained masses near base. Irregular parting and fracture.
2415.0	2416.0	Oil shale and nahcolite: medium brownish gray and brown oil shale (10YR 4/2-4/3, rare 5/3) and brownish black to dark brown nahcolite. Faint fairly smooth to some distorted streaks and laminae in oil shale. A 3-inch coarse nahcolite mass in middle; rare small masses in upper part. Irregular thick parting; slightly irregular to irregular fracture.
2416.0	2418.5	Oil shale and nahcolite: medium brown to rare dark brownish gray and tan oil shale (10YR 4/3-5/3, rare 3/2, rare 6/3 lower part); rare fine satiny to resinous streaks and stringers. Faint to some fairly distinct, slightly distorted to very distorted laminae, streaks, and stringers in oil shale. Common 1- to 3-inch coarse radiating nahcolite nodules. Irregular thick parting; slightly irregular to irregular and conchoidal fracture.
2418.5	2419.5	Oil shale and nahcolite: medium brown to rare dark brownish gray oil shale (10YR 4/3, some 5/3, rare 3/2). Faint to some moderately distinct, distorted to fairly smooth laminae and streaked bedding. An irregular 3-inch stringer (?) of pale brown to dark brownish gray, fine to fairly coarse crystalline nahcolite with common fine interstitial shale partings at 2418.8 feet; a 3-inch dark coarse radiating nodule at 2419.1 feet; some small irregular coarse nodules in lower part. Irregular parting and fracture.
2419.5	2429.9	<p>Sample of pale to medium brown, fine to medium crystalline nahcolite with common interstitial oil shale from 2418.8 feet: X-ray - quartz, nahcolite, dolomite, feldspar.</p> <p>Oil shale and nahcolite; medium brown to rare dark brownish gray and tan oil shale (10YR &amp; 2.5Y 4/3-5/3, rare 3/2 &amp; 6/3). Faint to rare distinct distorted laminae and streaks. Very common very</p>

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2429.9	2430.5	small to 2-inch dark coarse irregular to radiating nahcolite nodules; rare thin to thick fine grained stringers. Irregular parting and fracture. Nahcolite: very dark to pale brown. Moderately coarse to fine crystalline; common <u>very</u> fine interstitial oil shale (?) partings. Irregular thick parting; slightly irregular fracture.
2430.5	2432.0	Oil shale and nahcolite: medium brown to rare tan oil shale (10YR & 2.5Y 5/3, some 4/3, rare 6/3). Faint fairly smooth to distorted laminae and streaks. Very common very small to 1-inch coarse irregular to radiating nahcolite nodules; thin fine grained stringers at 2430.6 and 2430.8 feet. Irregular parting and fracture.
2432.0	2437.9	Oil shale and nahcolite: medium brown oil shale (10YR & 2.5Y 5/3-4/3) and brownish black to rare pale yellowish brown nahcolite. Faint distorted to some smooth laminae and streaked bedding in oil shale. Common 1- to 3-inch coarsely crystalline irregular to radiating nahcolite masses. Irregular parting and fracture.
2437.9	2442.1	Oil shale and rare nahcolite: medium to dark brownish gray and brown oil shale (10YR & 7.5YR 4/2 & 4/3-3/2). Very faint smooth to slightly distorted streaked bedding. Irregular to some slightly irregular thick parting; slightly irregular fracture. Common very fine disseminated crystals. A 1-1/2-inch coarse nahcolite stringer at 2438.9 feet; some very small to 1-inch, fine to moderately coarse crystalline nahcolite masses at 2441.6-2441.8 feet. Rare fine to thin, gray to black pyritic streaks and blebs from 2440.4 to 2441.0 feet.
2442.1	2443.3	Nahcolite: brownish black to rare pale yellowish brown. Large coarsely crystalline radiating aggregates and some massive medium to fine grained; common fine interstitial oil shale partings. Irregular parting and fracture. Sample includes some oil shale at top and bottom.
2443.3	2444.7	Oil shale and nahcolite: dark to rare medium brownish gray oil shale (10YR & 7.5YR 3/2, rare 4/2). Very faint slightly distorted to very distorted streaked bedding in oil shale. Irregular thick parting; slightly irregular to irregular fracture. Common small blebs and thin stringers to very irregular large masses of fine to coarse crystalline nahcolite. Rare very fine disseminated crystals in oil shale.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2444.7	2446.9	Oil shale and nahcolite: dark to medium brownish gray and brown oil shale (10YR & 7.5YR 3/2-4/2 & 4/3). Faint distorted to some fairly smooth streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. A very large coarse nahcolite mass at 2445.4-2445.9 feet; some very irregular small to 2-inch masses and thin stringers of fine to rare coarse crystalline nahcolite in other parts.
2446.9	2448.9	Oil shale and nahcolite: dark to rare medium brownish gray oil shale (10YR 3/2, rare 4/2). Very faint distorted streaked bedding. Irregular thick parting; irregular to some conchoidal fracture. Common 2- to 3-inch coarse nahcolite masses.
2448.9	2449.9	Nahcolite: brownish black to some pale yellowish brown. Fairly coarse to medium crystalline; very common fine very dark brownish gray interstitial oil shale partings. Irregular parting and fracture.
2449.9	2451.1	Nahcolite: brownish black to pale yellowish brown. Medium to fine and some coarse crystalline; very common fine interstitial partings to some thin stringers of dark brownish gray to medium brown oil shale. Irregular parting and fracture. <div style="margin-left: 40px;">Sample of medium to fine grained nahcolite with interstitial oil shale from 2451.0 feet:  X-ray - nahcolite; some dolomite, dawsonite, quartz, feldspar.</div>
2451.1	2452.8	Oil shale and nahcolite: dark brown and brownish gray to tan and buff oil shale (10YR & 7.5YR 4/3-5/3 & 5/4, some 3/3-3/2 upper part, some 6/3-7/2 lower part) and brownish black to dark and rare pale brown nahcolite. Faint to some fairly distinct distorted laminae and streaks in oil shale. Common small to 3-inch coarse radiating to irregular nahcolite masses. Very irregular thick parting; irregular to some conchoidal fracture. <div style="margin-left: 40px;">Sample of brown to tan and buff laminated oil shale from 2452.7 feet:  X-ray - dolomite, quartz, feldspar, some dawsonite.</div>
2452.8	2454.0	Oil shale and nahcolite: medium brownish gray and some brown to rare tan and buff oil shale (10YR & 2.5Y 4/2-5/2, some 4/3-5/3, rare 6/3-7/2). Faint and rare distinct, fairly smooth to distorted laminae and streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Some large coarse nahcolite masses at 2453.4-2453.8 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2454.0	2455.0	Oil shale: medium to rare dark brownish gray and brown, very rare tan to buff (10YR & 2.5Y 4/2 & 4/3, rare 3/2 and 6/3-7/2). Faint and rare distinct fairly smooth laminae and streaks; some fine loop structures and displacements. Irregular thick parting; slightly irregular and rare coarse hackly fracture. Some small hackly to feathery, dark gray to black pyritic masses at 2454.9 feet.
2455.0	2456.3	Oil shale: dark to medium brownish gray and brown (10YR & 7.5YR 3/2-4/2 & 4/3). Faint fairly smooth streaked bedding. Irregular thick parting; slightly irregular and conchoidal fracture. Some <u>very</u> fine disseminated crystals.
2456.3	2457.6	Oil shale: dark to rare medium brownish gray (10YR & 7.5YR 3/2, rare 4/2 & 2/2); rare very fine satiny to resinous streaks. Very faint fairly smooth streaked bedding. Irregular thick parting; slightly irregular to irregular and conchoidal fracture. Some <u>very</u> fine disseminated crystals.
2457.6	2459.2	Oil shale and rare nahcolite: medium to dark brownish gray and brown oil shale (10YR & 7.5YR 4/2 & 4/3-3/2); some very fine satiny to rare resinous streaks. Very faint to faint, fairly smooth to distorted streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Rare very irregular small to large nahcolite masses with fine black pyritic rims and stringers. Some very small dense brown to tan lenses near base.
2459.2	2460.8	Oil shale: dark to some medium brownish gray and brown (10YR & 7.5YR 3/2, some 4/2-4/3); some very fine satiny to rare resinous streaks. Faint distorted to fairly smooth streaked bedding. Irregular to some slightly irregular thick parting; irregular to slightly irregular fracture. Some <u>very</u> fine disseminated crystals. A small black pyritic nodule with some nahcolite (?) at 2459.5 feet.
2460.8	2462.0	Oil shale: dark brownish gray (10YR & 7.5YR 3/2-2/2); rare very slight satiny luster. Very faint fairly smooth to some distorted streaked bedding. Irregular to some slightly irregular thick parting; slightly conchoidal to irregular fracture. Fairly common very fine disseminated crystals.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2462.0	2464.2	Oil shale: Dark to rare medium brownish gray and brown (10YR 3/2, rare 4/2-4/3); rare fine satiny to resinous streaks. Faint slightly distorted to smooth streaked bedding. Irregular to some slightly irregular thick parting; slightly irregular to irregular fracture. Some very fine disseminated crystals.
2464.2	2465.3	Oil shale: dark to medium brownish gray and brown (10YR 3/2-4/2 & 4/3). Faint fairly smooth to some very distorted streaked bedding. Irregular thick parting; slightly irregular fracture. Some very fine irregular black pyritic stringers with rare fine milky white crystalline blebs in middle part.
2465.3	2469.0	Oil shale: dark brownish gray (10YR & 7.5YR 3/2-2/2). Very faint slightly distorted to smooth streaked bedding. Irregular thick to rare medium parting; slightly conchoidal to irregular and rare slight hackly fracture. Very common very fine disseminated crystals.
2469.0	2473.3	Oil shale: dark brownish gray, some dark to medium brown at 2469.4-2469.6 feet (10YR & 7.5YR 3/2-2/2, some 3/3-4/3 upper part). Very faint smooth streaked bedding and some very fine laminae. Irregular to some slightly irregular thick parting; slightly irregular and conchoidal fracture. Common <u>very</u> fine disseminated crystals. Some fine broken columnar pyrite streaks with vitreous black organic material at 2472.2 feet.
2473.3	2474.3	Oil shale: dark brownish gray (7.5YR & 10YR 3/2, rare 2/2). Very faint smooth to slightly distorted streaked bedding and rare laminae. Irregular thick to medium parting; slightly conchoidal to irregular fracture. Very common <u>very</u> fine disseminated crystals.
2474.3	2476.3	Oil shale: very dark brownish gray (10YR 2/2, rare 3/2). Very faint smooth streaked bedding. Irregular to slightly irregular, thick to medium parting; slightly conchoidal to irregular and some coarse hackly fracture. Common to rare <u>very</u> fine disseminated crystals. Some very fine silty-textured pyrite streaks. A short vertical fracture with resinous to vitreous black organic fillings at 2475.0 feet.
2476.3	2480.6	Oil shale: dark brownish gray (10YR 2/2 & 2/1-3/2 & 3/1). Very faint very smooth streaked bedding and rare very fine laminae. Slightly irregular to irregular thick parting; Fairly smooth to some

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		irregular and conchoidal fracture. Some to common <u>very</u> fine disseminated crystals. Some very fine columnar to silky pyrite streaks with vitreous black organic material at 2478.3 feet.
		[ Sample of oil shale from 2477.7 feet: X-ray - Quartz, dolomite, feldspar, dawsonite, ferroan, pyrite, illite.
2480.6	2481.7	Oil shale: dark to medium brownish gray (10YR 3/2 & 3/1-4/2 & 4/1). Faint smooth streaked bedding. Slightly irregular to irregular, thick to medium parting; fine hackly fracture. Common very fine disseminated crystals and crystalline streaks (dawsonite).
2481.7	2485.3	Oil shale: medium and some dark brownish gray (10YR 4/2 & 4/1-5/2 & 5/1, some 3/2-3/1 upper and lower parts). Very faint smooth streaked bedding. Slightly irregular thick to medium parting; fine hackly fracture. Common very fine disseminated crystals and crystalline streaks (dawsonite). [ Sample of medium brownish gray oil shale with common very fine dawsonite from 2483.0 feet: X-ray - dawsonite, dolomite, quartz, feldspar ferroan.
2485.3	2486.7	Oil shale: dark brownish gray to some black (10YR 3/2 & 3/1-2/2, some 1/2). Very faint slightly distorted to smooth streaked bedding. Slightly irregular to irregular thick parting; slight to rare coarse hackly fracture. Common very fine disseminated crystals and crystalline streaks (dawsonite).
2486.7	2488.8	Oil shale: very dark brownish gray and rare black (10YR 2/2-2/1, rare 1/2 upper part). Very faint smooth streaked bedding; some very faint laminae near top. Slightly irregular to irregular, thick to medium parting; slight to rare coarse hackly fracture. <u>Very</u> common very fine disseminated crystals and crystalline streaks (dawsonite). Rare short irregular high angle fractures with slight resinous to vitreous black coatings. [ Sample of very dark shale with very common dawsonite from 2487.1 feet: X-ray - quartz, dawsonite, feldspar, dolomite, ferroan, pyrite.

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Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2488.8	2489.8	Oil shale: very dark brownish gray (10YR 2/2-2/1, some 3/1 lower part). Very faint smooth streaked bedding. Slightly irregular thick to medium parting; slightly irregular and rare slight to coarse hackly fracture. Fairly common <u>very</u> fine disseminated crystals.
2489.8	2492.0	Oil shale: dark to medium brownish gray (10 YR 3/1-4/1). Very faint smooth streaked bedding. Slightly irregular to irregular, thick to medium parting; slight to some coarse hackly fracture. Fairly common <u>very</u> fine disseminated crystals; some very fine crystalline streaks and laminae near base. A 1/2 -inch gray silty-textured to very fine crystalline band with common very fine disseminated pyrite at 2491.9 feet (some fine short tight to slightly open vertical fractures with dirty yellow to brown stains). <div style="margin-left: 20px;">                     Sample of thin gray pyritic band from 2491.9 feet:                      X-ray - albite, dawsonite, quartz, ferroan, pyrite.                 </div>
2492.0	2495.4	Oil shale: medium to dark brownish gray (10YR 4/1-3/1). Very faint smooth laminae and streaked bedding. Slightly irregular to irregular, thick to medium parting; slightly hackly fracture. <u>Very</u> common very fine dawsonite streaks, laminae, and disseminated crystals. <div style="margin-left: 20px;">                     Sample of shale with fine dawsonite streaks and laminae from 2494.8 feet:                      X-ray - dawsonite, quartz, ferroan, dolomite, feldspar.                 </div>
2495.4	2496.4	Oil shale: dark brownish gray (10 YR 3/1 & 3/2-2/2). Very faint smooth laminae and streaked bedding. Slightly irregular to irregular thick parting; slight to some coarse hackly fracture. Very common very fine disseminated crystals and crystalline streaks (dawsonite).
2496.4	2500.0	Oil shale: dark brownish gray to some black (10YR 2/2, some 3/1 upper part, some 1/2 lower part). Very faint smooth laminae and streaked bedding. Irregular thick parting; irregular and conchoidal to some smooth fracture. Common <u>very</u> fine disseminated crystals becoming barely visible toward base. Some fine lacy black pyritic stringers in lower part. <div style="margin-left: 20px;">                     Sample of very dark brownish gray to black shale with <u>very</u> fine disseminated crystals from 2499.4 feet:                      X-ray - quartz, dawsonite, feldspar, dolomite.                 </div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2500.0	2502.5	Oil shale: dark brownish gray (10YR 2/2-3/2 & 3/1). Very faint smooth to some slightly distorted streaked bedding. Irregular thick parting; fairly smooth to irregular and conchoidal fracture. Some very fine dense dark gray streaks. <div> Sample of shale with some very fine dark gray streaks from 2501.7 feet:  X-ray - quartz, dawsonite, feldspar, dolomite, pyrite. </div>
2502.5	2503.5	Oil shale: dark brownish gray (10YR & 7.5YR 2/2-3/2); some satiny luster near base. Very faint smooth streaked bedding to faint laminae; rare fine loop structures and displacements. Slightly irregular to irregular thick parting; fairly smooth to irregular and conchoidal fracture. Some very fine dark gray streaks near top. Some very fine black pyritic streaks and blebs near base. <div> Sample of very dark slightly satiny shale with fine black pyritic streaks and blebs from 2503.4 feet:  X-ray - quartz, dawsonite, pyrite, ferroan, feldspar, dolomite. </div>
2503.5	2505.6	Nahcolite and some oil shale: brownish black to very pale brown and rare colorless nahcolite and dark brownish gray oil shale (10YR & 7.5YR 2/2-3/2). Medium to coarse crystalline nahcolite with common very fine to thin interstitial shale partings and rare thick stringers. Very irregular parting, and fracture. <div> Sample of dark to very pale brown moderately coarse crystalline nahcolite from 2504.8 feet:  X-ray - nahcolite. </div>
2505.6	2508.0	Oil shale and nahcolite: medium to some dark brown and brownish gray oil shale (10YR 4/3 & 4/2, some 3/2, rare 5/3-5/2) and brownish black to dark brown nahcolite. Faint distorted to some fairly smooth laminae and streaked bedding. Common small to 2-inch coarsely crystalline irregular to radiating nahcolite masses. Irregular parting and fracture. <div> Sample of medium to dark brown and brownish gray oil shale from 2507.2 feet:  X-ray - dolomite, quartz, dawsonite, feldspar, ferroan? </div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2508.0	2509.0	Oil shale and some nahcolite: medium to very rare dark brown and brownish gray oil shale (10YR 5/3 & 5/2-4/3 & 4/2, very rare 3/2-2/2). Faint distorted to fairly smooth laminae and streaked bedding. Fairly regular to irregular, thick to medium parting (some curved); irregular to slight and rare coarse hackly fracture. Rare small nahcolite masses and thin stringers. Rare very fine short tight nahcolite-filled vertical fractures. Common very fine disseminated crystals in lower part.
2509.0	2510.0	Oil shale and some nahcolite: medium and very rare dark brown and brownish gray oil shale (10YR & 7.5YR 4/3-4/2, rare 3/2). Very faint fairly smooth to distorted streaked bedding. Irregular to slightly irregular, thick to medium parting; irregular to coarse hackly fracture. Fairly common very fine disseminated crystals. Some 1- to 2-inch coarse radiating nahcolite nodules. Some short tight vertical fractures with brown to black tarry coatings in upper part.
2510.0	2511.5	Oil shale: medium brownish gray and brown to rare tan (10YR 4/2 & 4/3-5/2 & 5/3, rare 6/3 lower part). Very faint to rare moderately distinct, smooth and rare distorted laminae and streaked bedding; some very fine loop structures and displacements. Slightly irregular to very regular, thick to medium parting; slight hackly to fairly smooth fracture. Common very fine disseminated crystals in some parts. Rare thin fine grained nahcolite stringers. A very thin flat dull black silty-textured lens or stringer at 2510.8 feet.
2511.5	2512.5	Oil shale and some nahcolite: medium brownish gray and brown oil shale (10YR 4/2 & 4/3, some 5/2 & 5/3). Faint smooth to distorted laminae and streaked bedding. Fairly regular to irregular, thick to medium parting; slight to coarse hackly and some irregular fracture. Some very fine disseminated crystals. A 3-inch coarse radiating nahcolite mass in middle. Some short tight vertical fractures with tarry coatings immediately above nahcolite.
2512.5	2513.5	Oil shale: medium brownish gray and brown to very rare tan (10YR 4/2-4/3, some 5/2-5/3, rare 6/3). Faint to rare distinct, smooth to intricately

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Contorted and displaced laminae and streaked bedding; some very fine loop structures. Slightly irregular to irregular thick parting; slight hackly fracture. Some very fine disseminated crystals. An irregular vertical fracture with black coatings and some nahcolite(?) crusts in lower 4 inches.
2513.5	2516.7	Oil shale: medium to rare dark brown and brownish gray (10YR 4/3-4/2, some 5/3-5/2, rare 3/2). Faint fairly smooth to distorted laminae and streaked bedding. Irregular to some slightly irregular, thick to medium parting; slight hackly to irregular fracture. Rare very fine disseminated crystals. Irregular parting surfaces with small crystalline blebs and fine black stringers at 2513.7 feet; fractured earthy weathered shale with fine crystalline blebs and black stringers on irregular parting surfaces at 2514.9 feet. Some fine nahcolite(?) streaks at 2515.1 feet. A very irregular small black mass with fine crystalline blebs 2515.6 feet. An irregular vertical fracture with tarry coatings in upper 3 inches; rare short tight vertical fractures in other parts. Very abrupt change to dark oil shale at base. (0.2 foot missing at 2514.9 feet?)
		Sample of earthy weathered shale with some fine crystalline blebs from 2514.9 feet: X-ray - nahcolite, dawsonite, dolomite, quartz, barytocalcite, feldspar.
2516.7	2517.7	Oil shale: dark and some medium brownish gray (10YR 3/2-2/2, some 4/2-5/2 middle part). Faint smooth to slightly distorted streaked bedding. Irregular thick parting; slightly irregular to slight hackly fracture. A 1-inch finely fractured zone with common fine nahcolite(?) crystals and fine black pyritic streaks and blebs at 2517.1 feet; some fine lacy black pyritic fracture fillings at 2517.4 feet.
		Sample of finely fractured shale with nahcolite(?) crystals and black pyritic streaks and blebs from 2517.1 feet: X-ray - quartz, dolomite, dawsonite, calcite, feldspar, barytocalcite?

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2517.7	2521.2	Oil shale: dark brownish gray (10YR 3/2-3/1). Very faint smooth streaked bedding. Irregular to slightly irregular thick parting; slightly irregular and conchoidal to some irregular fairly coarse hackly fracture. Some very fine disseminated crystals in lower part. A 2-inch zone of medium to light brownish gray shale at 2520.7 feet; gradational color change from top down, becoming finely contorted and displaced to fractured with fine black pyritic streaks at base; abrupt change to dark shale at base of zone.
2521.2	2522.2	Oil shale: dark brownish gray (10YR 3/2-2/2); Common very slight satiny luster in lower part. Very faint smooth streaked bedding. Irregular thick parting; conchoidal fracture.
2522.2	2523.3	Oil shale: dark to medium brownish gray and brown (7.5YR & 10YR 3/2-4/2 & 4/3, some 2.5Y 3/2-4/2); Some fine satiny to rare resinous laminae and streaks. Faint slightly distorted to smooth laminae and streaks. Irregular to slightly irregular thick parting; slightly irregular and slight hackly to fairly smooth fracture.
2523.0	2526.9	Oil shale: medium to some dark brownish gray and brown (7.5YR & 10YR 4/2-4/3, some 3/2 lower part, rare 2.5Y 4/2); rare fine satiny to resinous streaks and laminae. Moderately distinct to faint, fairly smooth to distorted streaks, stringers, and rare laminae; some fine distinct tan to buff streaks. Irregular thick parting; fine to course hackly and some fairly regular fracture. Some very fine lacy fractures with black pyritic fillings and crystalline blebs at 2523.7 and 2524.1-2524.3 feet. <div style="margin-left: 2em;">Sample of brown oil shale from 2523.5 feet:  X-ray - dolomite, quartz, feldspar, dawsonite.</div>
2526.9	2527.9	Oil shale: medium to some dark brownish gray and rare brown (2.5Y 4/2, some 3/2, rare 10YR & 7.5YR 4/2 & 4/3-3/2). Very faint slightly distorted to very distorted streaked bedding. Slightly irregular to irregular thick parting; slight hackly fracture. Rare very fine disseminated crystals and fine crystalline blebs. <div style="margin-left: 2em;">Sample of brownish gray oil shale from 2527.5 feet:  X-ray - dolomite, quartz, feldspar, dawsonite, pyrite.</div>

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Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2527.9	2530.9	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, rare 2/2). Faint distorted to fairly smooth streaked bedding. Irregular thick parting; slightly irregular to irregular and conchoidal fracture. Fairly common very fine disseminated crystals in some parts. Common fine lacy black stringers at 2530.4-2530.6 feet.
2530.9	2532.4	Oil shale: dark brownish gray to some black (10YR 2/2-3/2, some 1/2); some satiny luster. Faint smooth to some distorted and displaced streaked bedding and rare laminae. Slightly irregular thick parting; slightly irregular fracture. Rare fine dense dark to medium brownish gray streaks and blebs.
2532.4	2533.4	Oil shale: dark brownish gray (10YR 2/2-3/2); common very fine satiny streaks. Very faint smooth streaked bedding. Slightly irregular thick parting; slightly irregular and conchoidal fracture. Abrupt change to lighter shale at base.
2533.4	2534.4	Oil shale: medium and some dark brownish gray and brown (10YR & 7.5YR 4/2-4/3, some 3/2 upper part, rare 5/2 lower part). Faint slightly distorted to very distorted streaks and stringers; some contorted stringers with moderately distinct irregular unconformable internal laminae in middle part. Irregular thick parting; slightly irregular to slight and rare coarse hackly fracture. Rare fine crystalline streaks and blebs. Some very irregular fine black pyritic stringers in contorted shale in middle part.
2534.4	2535.7	Oil shale: medium brownish gray and brown to some tan and buff (10YR 4/2-4/3, some 5/3-6/3 & 7/2). Faint to distinct, very distorted to intricately contorted and displaced streaks and rare laminae. Irregular thick parting; irregular and some very slight hackly fracture. Some very irregular small dense to fine grained crystalline patches. <div style="margin-left: 40px;">Sample of contorted shale with irregular crystalline patches from 2534.8 feet:  X-ray - dolomite, quartz, dawsonite, feldspar, illite.</div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2535.7	2536.9	Oil shale: medium brownish gray and brown (10 YR 4/2-4/3, rare 5/3). Faint very distorted to slightly distorted streaks and stringers. Irregular thick parting; irregular and some slight to coarse hackly fracture. Rare fine crystalline blebs. Some fine black pyritic stringers at 2535.9 feet.
2536.9	2538.0	Oil shale: dark and rare medium brownish gray to some black (10YR & 7.5YR 3/2-2/2, rare 4/2 upper part, some 1/2 lower part); some slight satiny luster. Faint slightly distorted to smooth streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Rare fine crystalline patches and blebs. A thin tan slightly earthy lens near top.
2538.0	2539.5	Oil shale: dark brownish gray to rare black (10YR & 7.5YR 3/2-2/2, rare 1/2); rare slight satiny luster. Faint smooth to some slightly distorted streaked bedding. Irregular thick parting; slightly irregular to irregular fracture. Some very fine disseminated crystals and rare crystalline patches.
2539.5	2541.5	Oil shale: dark brownish gray (10YR 3/2-2/2). Faint smooth laminae and streaked bedding. Slightly irregular to very regular, thick to medium parting; very slight to rare fairly coarse hackly fracture. Very common very fine crystalline streaks (dawsonite)--some with common pyrite. Some very fine tight irregular high angle fractures with slight resinous dark brown coatings in upper part. <div style="margin-left: 40px;">Sample of oil shale with common dawsonite from 2540.4 feet: X-ray - quartz, dawsonite, feldspar, dolomite, pyrite.</div>
2541.5	2543.2	Oil shale: dark brownish gray to rare black (10YR 3/2-2/2, some 3/1, rare 1/2 lower part). Faint smooth laminae and streaked bedding. Fairly regular to irregular thick parting; slightly conchoidal to smooth fracture. Rare very fine silty-textured pyrite streaks and blebs. <div style="margin-left: 40px;">Sample of oil shale with some very fine pyrite streaks and blebs from 2542.2 feet: X-ray - quartz, dawsonite, dolomite, feldspar, pyrite, illite.</div>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2543.2	2544.5	Oil shale: dark brownish gray to rare black (10YR & 7.5YR 3/2-2/2, rare 1/2); common satiny to resinous luster--especially in lower part. Faint fairly smooth to distorted and displaced streaks, and rare laminae. Slightly irregular to irregular thick parting; slightly irregular to irregular and some slight to coarse hackly fracture. Very rare fine crystalline blebs.
2544.5	2545.5	Oil shale: very dark brownish gray to black (10YR & 7.5YR 2/2-1/2); very common satiny to resinous luster and some very fine waxy streaks. Very faint slightly distorted to smooth streaks and some laminae. Slightly irregular to irregular, thick to medium parting; irregular to coarse hackly fracture. <div style="margin-left: 40px;">Sample of black satiny to resinous oil shale from 2544.8 feet:  X-ray - quartz, dolomite, feldspar, illite, dawsonite, ferroan, pyrite.</div>
2545.5	2547.7	Oil shale: very dark brownish gray (10YR 2/2, some 3/2). Very faint smooth streaked bedding and some laminae. Very regular to slightly irregular, thick to medium and rare thin parting; slight to some coarse hackly fracture. Common very fine disseminated crystals and crystalline streaks (dawsonite). Rare fine pyrite streaks and blebs in lower part. Two very thin dense dark brownish gray laminae at 2546.7 feet; a 1-inch dense dark brownish gray to medium almost neutral gray band with some irregular vertical fractures and rare fine pyrite streaks at 2547.0 feet (like 2547.8 feet).
2547.7	2548.8	Oil shale: dark brownish gray (10YR 3/2, some 3/1). Very faint smooth to slightly distorted streaked bedding. Slightly irregular to irregular thick parting; irregular fracture. An irregular vertical fracture with fine vitreous black organic crusts extends through interval. A 1-1/4-inch dense dark brownish gray faintly bedded band at top. <div style="margin-left: 40px;">Sample of dense dark brownish gray band from 2547.8 feet:  X-ray - dolomite.</div>
2548.8	2550.0	Oil shale: dark brownish gray (10YR 3/2-2/2). Very faint smooth streaked bedding and some laminae. Irregular to very regular, thick to medium parting; irregular and conchoidal to some hackly fracture. Irregular vertical fracture with organic crusts extends a few inches into section from above.

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2550.0	2551.0	Oil shale: medium and some dark brownish gray (10YR & 2.5Y 4/2-5/2, some 3/2 upper part). Very faint smooth streaked bedding to faint laminae. Irregular to regular, medium to thin shaly and some papery partings; coarse hackly to irregular fracture. A 1-inch dense brownish gray faintly bedded to laminated band at 2550.6 feet. A very fine buff earthy to crystalline stringer at 2550.8 feet.
2551.0	2552.0	Oil shale: medium to some light brownish gray (10YR & 2.5Y 4/2-5/2, some 6/2). Faint to fairly distinct very smooth laminae. Regular to some irregular, thick to thin shaly parting; slight to coarse hackly fracture. Rare fine dark gray discolored streaks. Rare very fine buff crystalline streaks with common pyrite in lower part. [ Sample of oil shale from 2551.2 feet: X-ray - dolomite, quartz, illite, feldspar.
2552.0	2554.0	Oil shale: medium to dark brownish gray (2.5Y & 10YR 4/2 & 4/1-3/2 & 3/1, some 5/2-5/1 upper part). Faint to very faint smooth laminae and streaked bedding. Very regular medium to thin shaly parting; hackly fracture. Fairly common very fine buff crystalline streaks--some show as fine silky radiating aggregates on parting surfaces. [ Sample of shale with fine buff silky spots from 2552.1 feet: X-ray - dolomite, quartz, illite, feldspar, pyrite, dawsonite, analcite.
2554.0	2556.0	Oil shale: dark brownish gray (10YR & 2.5Y 3/2, rare 3/1). Very faint smooth streaked bedding and some laminae. Regular to some irregular, medium to thin shaly parting; coarse to slight hackly fracture.
2556.0	2557.0	Oil shale: dark to rare medium brownish gray (10YR & 2.5Y 3/2-3/1, rare 4/1). Very faint smooth streaked bedding and some laminae. Regular to some irregular, thick to medium parting; slightly irregular to rare coarse hackly fracture.
2557.0	2558.0	Oil shale: dark to medium brownish gray (2.5Y & 10YR 3/2 & 3/1-4/1). Very faint smooth and rare distorted streaked bedding. Regular to some irregular, medium to thin shaly parting; hackly fracture. Very rare very fine crystalline streaks and stringers [ Sample of shale with some very fine crystalline streaks from 2557.4 feet: X-ray - illite, quartz, dolomite, feldspar, ferroan, pyrite.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No.1 --Continued

From	To	Description
2558.0	2559.0	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, some 2.5Y 3/2 & 3/1-4/1 upper part). Faint smooth to slightly distorted streaked bedding. Regular to irregular, thick to thin parting; hackly fracture.
2559.0	2560.4	Oil shale: dark to medium brownish gray (2.5Y & 10YR 2/2-4/2). Faint fairly smooth streaked bedding. Regular to some irregular, thick to medium and rare thin parting; coarse hackly to slightly irregular fracture.
2560.4	2560.6	Missing? Several inconsistencies in original footage marks from 2560.4 to 2575.0 feet.
2560.6	2561.2	(Misplaced core?) Oil shale: very dark brownish gray to some black (10YR 2/2, some 1/2, rare 3/2) some very slight satiny luster. Very faint smooth streaked bedding. Slightly irregular to irregular, medium to thin parting; coarse hackly fracture. Rare very fine dark dense to crystalline streaks and stringers. (Section does not match with shale above or below.)
2561.2	2561.4	Missing?
2561.4	2563.1	Oil shale: dark to medium brownish gray and brown (10YR & 7.5YR 3/2-4/2 & 4/3, rare 2/2 & 5/3, some 2.5Y 4/2-4/1 near top); Common satiny to rare resinous luster in dark parts. Faint smooth streaked bedding near top; faint to distinct, distorted to contorted streaks and stringers in other parts. Regular medium to thin shaly parting and hackly fracture near top; irregular parting and fracture in other parts. Rare fine crystalline streaks. (Continuous fitting core; change in rock character near top is real).
2563.1	2565.4	Oil shale: dark brownish gray to rare medium brown and black (10YR & 7.5YR 3/2-2/2, rare 4/2-4/3, rare 1/2 lower part); common slight satiny luster; rare resinous luster in lower part. Faint to rare moderately distinct, slightly distorted to very distorted streaks and stringers. Irregular to rare fairly regular thick parting; irregular and some coarse hackly fracture. Occasional fine brown crystalline streaks and very small blebs. Rare very small dark dense cherty (?) nodules.
2565.4	2566.5	Oil shale: very dark brownish gray to black (10YR 2/2-1/2); some very slight satiny luster. Very faint fairly smooth streaked bedding. Fairly regular to irregular, thick to thin parting; hackly fracture. Some fine dark dense pyritic

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		<p>streaks and blebs with tan to buff silky rims. A very smooth nearly vertical natural (??) fracture in lower half. A fine striated vitreous black organic crust on parting surfaces at 2566.3 feet.</p> <p>Sample of shale with fine dark dense blebs from 2565.6 feet:</p> <p>X-ray - quartz, dolomite, feldspar, illite, pyrite.</p>
2566.5	2571.4	<p>Oil shale: very dark brownish gray to black (10YR 2/2-1/2, rare 3/2). Very faint smooth streaked bedding and some laminae. Regular to irregular, medium to thin shaly parting; very hackly fracture. Occasional fine dense dark streaks, stringers, and blebs--some pyritic. Rare short tight vertical fractures with brownish black resinous coatings. Rare thin to 1-inch dense dark to medium brownish gray, faintly bedded to laminated bands (like 2547.8 feet).</p>
2571.4	2573.5	<p>Oil shale: dark brownish gray (10YR &amp; 7.5YR 3/2-2/2). Moderately distinct, distorted laminae with common fine to fairly large loop structures and displacements in upper 4 inches; faint fairly smooth laminae and streaked bedding with rare fine loop structures in other parts. Irregular to some fairly regular, thick to medium parting; irregular to very hackly fracture. Fairly common fine dark dense pyritic streaks, stringers, and blebs.</p>
2573.5	2574.7	<p>Oil shale: very dark brownish gray (10YR 2/2, rare 3/2). Very faint smooth streaked bedding and some laminae. Regular to some irregular, medium to thin shaly and some papery parting; very hackly fracture. Rare fine dense dark pyritic streaks in upper part. Common very fine crystalline streaks in middle part. Some very fine silty-textured pyrite streaks and laminae in lower part. (Footage adjustment-interval is 1.5 feet long).</p> <p>Sample of shale with very fine crystalline streaks from 2574.3 feet:</p> <p>X-ray - quartz, illite, analcite, ferroan, feldspar, pyrite, dolomite.</p>
2574.7	2575.7	<p>Oil shale: very dark brownish gray to rare black (10YR 2/2, rare 1/2 lower part, very rare 7.5YR 2/2); some satiny luster in lower part. Very faint smooth streaked bedding and some laminae in upper part; very faint distorted to contorted laminae and streaked bedding with some fine to 1/2-inch loop structures in lower 0.2 foot. Smooth</p>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		to slightly irregular and wavy, thin to thick parting; hackly to some irregular fracture. Very rare very fine dark dense streaks and stringers. Rare fine pyrite streaks near base. Sharp contorted but conformable contact with lighter shale below.
2575.7	2577.2	Oil shale: medium to dark brownish gray and some brown (10YR 4/2-3/2, some 4/3 upper part); fairly common fine satiny to resinous and rare waxy streaks. Fairly distinct to faint, contorted to slightly distorted streaks and laminae; some irregular loop structures and displacements. Irregular to some slightly irregular thick parting; irregular to some coarse hackly fracture. Rare fine pyrite streaks and blebs near base.
2577.2	2578.6	Oil shale: medium to rare dark brownish gray (10YR & 2.5Y 4/2, some 5/2, rare 3/2); some satiny to rare resinous and waxy streaks. Faint to moderately distinct distorted streaks and laminae; very common fine to small loop structures. Slightly irregular to irregular, thick to medium parting; irregular fracture. Very rare very fine pyrite streaks and blebs. Rare fine tan to buff streaks and stringers in lower part. A very small hard dense brownish black nodule at 2578.5 feet.
2578.6	2579.7	Oil shale: medium to dark brownish gray and rare black (10YR 4/2-3/2, some 2/2 & rare 1/2 lower part); fairly common satiny to some resinous and waxy luster. Faint to fairly distinct slightly distorted streaks and laminae; some irregular loop structures. Irregular to slightly irregular, thick to rare medium and thin parting; slight to coarse hackly and irregular fracture. Rare fine brown to tan streaks.
2579.7	2580.7	Oil shale: dark brownish gray and rare medium brown to some black (10YR & 7.5YR 3/2-2/2, some 1/2, rare 4/3); common satiny to resinous luster. Moderately distinct to faint, slightly distorted to smooth laminae and streaks; some fine loop structures in upper part. Regular to some irregular, thick to thin parting; hackly to irregular fracture. A small irregular dense brownish black cherty lense near top. Rare very fine crystalline streaks near base.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of dark brownish gray to black shale with very fine satiny to waxy streaks from 2580.2 feet: X-ray - quartz, illite, dolomite, feldspar, ferroan, pyrite.
2580.7	2581.7	Oil shale: very dark brownish gray to black (10YR 2/2-1/2); rare satiny to resinous luster near top. Very faint smooth streaked bedding. Slightly irregular to very smooth, thick to thin shaly parting; hackly fracture. Rare very fine silty-textured pyrite streaks and blebs. Very rare very fine dark dense streaks and blebs.
2581.7	2582.7	Oil shale: very dark brownish gray (10YR 2/2, some 3/2). Very faint smooth streaked bedding. Slightly irregular to regular, medium to thin shaly and some papery parting; hackly fracture. Common very fine pyrite streaks and some very fine crystalline streaks (like 2574.3 feet) in upper part.
2582.7	2587.9	Oil shale: dark to some medium brownish gray (10YR & 2.5Y 2/2-3/2 & 3/1, some 4/2-4/1). Very faint smooth streaked bedding. Irregular thin shaly to papery parting; (some slightly unctuous parting surfaces); very hackly fracture. A 1-1/2-inch dense brownish gray faintly bedded dolomite (?) band 2583.5 feet. Badly broken up and mixed up; true length doubtful.
		Sample of slightly unctuous shale from 2584.0 feet: X-ray - illite, quartz, dolomite, ferroan, feldspar, pyrite.
2587.9	2589.4	Oil shale: dark brownish gray (10YR 3/2). Very faint smooth streaked bedding. Irregular to very regular, thin to medium shaly and rare papery parting; hackly fracture. Rare very fine silty-textured pyrite streaks.
2589.4	2591.0	Oil shale: very dark brownish gray to black (10YR 2/2-1/2); rare slight satiny luster in upper part. Very faint smooth streaked bedding. Smooth to irregular, thin to medium shaly parting; hackly fracture. Rare very fine crystalline streaks in upper part. Very rare very fine silty-textured pyrite streaks. Irregular 1- and 2-inch dense dark to medium brownish gray dolomite (?) bands at 2589.7 and 2590.0 feet.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of dense dolomite (?) band from 2590.0 feet: X-ray - dolomite, trace quartz.
2591.0	2594.0	Oil shale: very dark brownish gray to black (10YR 2/2-1/2, rare 3/2 lower part). Very faint smooth streaked bedding. Irregular to smooth, thin to some medium shaly parting; hackly fracture. Very rare very fine silty-textured pyrite streaks. A 1-inch dense dark to medium brownish gray dolomite band with some vertical fractures with resinous black coatings at 2592.4 feet.
2594.0	2595.0	Oil shale: dark brownish gray (10YR 2/2-3/2 & 3/1). Very faint to faint smooth laminae and streaked bedding. Very smooth to some irregular, thin to thick shaly parting; coarse hackly to some fairly smooth fracture. Some very fine neutral gray laminae in lower part. A very fine tight nearly vertical fracture with crystalline fillings from 2594.5 to 2584.7 feet.
2595.0	2597.0	Oil shale: dark to medium brownish gray (10YR 2/2-4/2 & 4/1). Faint smooth laminae. Very regular to rare irregular, medium to thick parting; fairly smooth to very slight hackly fracture. Common very fine gray laminae.
		Sample of shale with common very fine gray laminae from 2595.6 feet: X-ray - quartz, illite, dolomite, calcite, feldspar, pyrite, dawsonite.
2597.0	2599.0	Oil shale: dark to medium brownish gray (10YR 3/2 & 3/1-4/2 & 4/1). Faint smooth laminae. Very regular to some irregular, thin to thick parting; very slight to rare coarse hackly and some fairly smooth fracture. Fairly common fine dark to medium gray laminae. Rare to very common very fine crystalline calcite laminae and streaks--some slightly prismatic.
		Sample of shale with common very fine calcite laminae and streaks from 2598.9 feet: X-ray - calcite, quartz, illite, dolomite, feldspar, pyrite, dawsonite?
2599.0	2600.0	Oil shale and gray shale: dark to medium brownish gray (10YR 3/1 & 3/2-4/1) and neutral gray (N 3-4). Faint smooth laminae to very faint streaked bedding. Very regular to rare irregular, thin to thick parting; hackly to slightly irregular and conchoidal fracture. Some very fine calcite

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Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		laminae and streaks in upper part. A 1-inch dense brownish gray dolomite band near top (like 2590.0 feet). (Footage adjustment--interval is 1.6 feet long).
		[ Sample of gray shale from 2599.9 feet: X-ray - dolomite, quartz, calcite, feldspar illite.
End of coring August 1965		
Start of coring June 1966		
2600.0	2603.0	Oil shale: dark to medium brownish gray (10YR 2/1 & 2/2-4/1 & 4/2; some almost neutral in upper part). Very faint smooth laminae and streaked bedding. Irregular to some regular, thin to rare thick parting (some slightly unctuous parting surfaces); very irregular coarse hackly fracture. Rare very fine silty-textured pyrite streaks. Some parts badly broken up and mixed up; true length doubtful.
2603.0	2604.0	Oil shale: dark and some medium brownish gray (10YR 3/2-2/2, some 4/2). Faint to some moderately distinct smooth laminae. Very smooth to irregular, thin to medium shaly parting; hackly fracture. Rare very fine dark dense pyritic streaks in lower part.
2604.0	2605.4	Oil shale: very dark brownish gray (10YR & 2.5Y 2/2). Very faint smooth streaked bedding. Irregular to very regular, thin to medium shaly parting; hackly fracture. Some very fine dense brownish gray dolomite laminae in upper part. Very rare fine silty-textured pyrite streaks. Very rare fine black fish bone fragments on parting surfaces.
2605.4	2606.5	Oil shale: dark brownish gray (10YR & 2.5Y 2/2, some 3/2). Very faint smooth streaked bedding. Irregular to smooth, thin shaly to some papery parting; hackly fracture. Some thin dense brownish gray dolomite bands in upper part. Very rare fish (?) fragments on parting surfaces.
2606.5	2608.5	Oil shale: dark brownish gray (2.5Y 2/2-3/2). Very faint smooth streaked bedding and some laminae. Irregular to regular, thin to thick parting; hackly to irregular fracture. Very rare very fine irregular pyrite streaks and stringers.

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Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2608.5	2610.0	Oil shale: dark to rare medium brownish gray (10YR 3/2, rare 2/2 & 4/2). Very faint smooth streaked bedding. Fairly smooth to irregular, thin to medium and rare thick shaly parting; hackly fracture. Very rare fine pyrite blebs.
2610.0	2612.0	Oil shale: very dark brownish gray (10YR 2/2, some 3/2). Very faint smooth streaked bedding. Fairly regular to irregular, thin to medium shaly parting; hackly fracture. A low angle glossy shear surface with very fine slicken-sides at 2610.3 feet. A 1-1/4-inch fairly dense medium to light brownish gray dolomite (?) band at 2610.5 feet. Some fine dense brownish black to rare buff streaks and blebs in middle part. Rare very fine silty-textured pyrite streaks and blebs in lower part.
2612.0	2613.6	Oil shale: dark brownish gray (2.5Y 3/2, some 2/2 upper part). Very faint smooth streaked bedding. Regular to some irregular, thin to medium and rare thick shaly parting; hackly fracture.
2613.6	2615.2	Oil shale: dark to medium brownish gray and brown, rare tan to buff (10YR 3/2-4/2 & 4/3, rare 2/2 & 5/3-7/2); some satiny luster. Faint to rare distinct, smooth to slightly distorted laminae and streaked bedding; some loop structures in upper part. Fairly regular to irregular, thick to thin parting; hackly fracture. Very rare fine silty-textured gray pyritic streaks. Rare fine dark dense streaks and blebs. Some short tight vertical fractures with dark brown resinous coatings in lighter colored zones.
2615.2	2618.0	Oil shale: very dark brownish gray and rare black (10YR 2/2, rare 1/E near top; rare 3/2 other parts). Very faint very slightly distorted to smooth streaked bedding. Regular to rare irregular, thick to rare thin parting; slight to coarse hackly fracture. Fairly common very fine pyritic crystalline streaks--show on parting surfaces as very fine crusts with common very fine irregular buff slightly earthy patches.
		[ Sample of oil shale with some very fine pyritic crystalline streaks from 2616.1 feet: X-ray - quartz, illite, pyrite; some analcite, feldspar, dolomite.
2618.0	2620.0	Oil shale: dark to some medium brownish gray (10YR 2/2-3/2, some 4/2 lower part). Very faint to faint, smooth to some slightly distorted streaked bedding.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Irregular to regular, thick to thin parting; hackly fracture. Rare fine dark dense to crystalline pyritic streaks, stringers, and blebs. A 1-inch brownish gray to brown band with some vertical to very irregular fractures with resinous black crusts near top. A low angle glossy shear surface at 2618.4 feet.
2620.0	2621.0	Oil shale: dark to some medium brownish gray (10YR 3/2-2/2, some 4/2). Faint smooth to some distorted laminae and streaked bedding. Slightly irregular to irregular, thin to thick parting; hackly to irregular fracture; 1-inch bands of dense massive to faintly bedded dolomite at 2620.3 and 2620.6 feet. Some massive tan laminae and very fine streaks near base.
2621.0	2622.0	Oil shale: very dark brownish gray (10YR 2/2). Very faint smooth streaked bedding. Regular to rare irregular, thick to thin shaly parting; coarse hackly fracture. Some very fine crystalline streaks and rare laminae (like 2616.1 feet).
2622.0	2627.6	Oil shale: very dark brownish gray (10YR 2/2, rare 3/2). Very faint smooth streaked bedding. Regular to some irregular, thick to thin shaly parting; hackly fracture. Rare very fine pyritic streaks.
2627.6	2628.8	Oil shale: dark to some medium brownish gray and rare brown to tan (10YR & 7.5YR 2/2-3/2, some 4/2, rare 4/3-6/3). Faint to rare distinct fairly smooth laminae and streaked bedding; some fine loop structures. Slightly irregular thick to thin parting; hackly to irregular fracture. Common thick bands to fine laminae of fairly dense brownish gray to brown dolomite with very fine tan to buff streaks. Some very irregular tight natural fractures in dolomite in upper part.
2628.8	2630.0	Oil shale: very dark brownish gray and rare black (10YR & 7.5YR 2/2, rare 3/2 & 1/2). Very faint smooth streaked bedding. Very regular to slightly irregular, thin to rare thick shaly parting; hackly fracture. Rare very fine silty-textured pyrite streaks and blebs. Rare fish fossil(?) fragments.
2630.0	2631.0	Oil shale: dark brownish gray (10YR 3/2 & 3/1-2/2). Very faint smooth streaked bedding. Regular to irregular, thin to rare thick shaly parting; slight to coarse hackly fracture. Very rare fish fossil (?) fragments in upper part.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2631.0	2633.0	Oil shale: dark brownish gray (10YR 3/1 & 3/2-2/2). Very faint smooth streaked bedding. Regular to irregular, thin to medium parting; hackly fracture. Very rare fine pyrite streaks. Very rare fossil fragments. A fine dense brownish gray dolomite laminae at base.
2633.0	2635.0	Oil shale: very dark brownish gray to black (10YR 2/2-1/2, some 3/2 upper part). Very faint smooth to rare slightly distorted streaked bedding. Regular to irregular, thin to medium parting; hackly fracture. Rare very fine silty-textured pyrite streaks and blebs. Some fine to thin dense dark to medium brownish gray laminae in upper part. Very rare fossil fragments. <div style="margin-left: 20px;">Sample of dense dark brownish gray lamina with some oil shale from 2633.7 feet:  X-ray - quartz, dolomite, illite, feldspar, pyrite.</div>
2635.0	2636.0	Oil shale: dark brownish gray (10YR 2/2 - 3/2 & 3/1). Very faint smooth streaked bedding. Irregular to some regular thin shaly parting; hackly fracture. A 4-inch very faintly bedded yellowish tan tuff (?) at top with some fine distorted oil shale stringers and short tight vertical fractures with dark brown resinous coatings in upper part. <div style="margin-left: 20px;">Sample of tan tuff (?) from 2635.3 feet:  X-ray - quartz, feldspar, ferroan, dolomite, dawsonite.</div>
2636.0	2638.0	Oil shale: dark to rare medium brownish gray (10YR 7 2.5Y 2/2-3/2 & 3/1, rare 4/2-4/1). Very faint to faint smooth laminae and streaked bedding. Regular to irregular, thick to thin shaly parting; hackly fracture. Common dense medium brownish gray dolomite laminae and streaks in upper part to rare in lower part.
2638.0	2641.0	Oil shale: dark to medium brownish gray (2.5Y & 10YR 3/2 & 3/1-4/2 & 4/1, rare 2/2). Faint smooth laminae and streaked bedding. Regular to irregular, thin to medium shaly parting; hackly fracture.
2641.0	2642.0	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, some 2/2). Faint to some moderately distinct smooth laminae; rare fine loop structures and displacements. Regular to some irregular, medium to thin shaly parting; hackly fracture.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2642.0	2644.0	Oil shale: dark to some medium brownish gray (10YR 2/2-3/2, some 4/2). Faint to some moderately distinct smooth laminae and streaked bedding; very rare fine displacements. Regular to some irregular, thin to medium shaly parting; coarse to slight hackly fracture. Rare very fine silty-textured pyrite streaks. Some lighter colored laminae have common very short tight <u>vertical fractures with resinous black coatings</u> .
2644.0	2646.0	Oil shale: very dark brownish gray (10YR 2/2, rare 3/2). Very faint smooth streaked bedding and some laminae. Very regular to slightly irregular, thin to medium and rare thick shaly parting; hackly fracture. Some <u>very</u> fine silty-textured pyrite (?) streaks. Some very fine copper flakes on parting surfaces at base (artificially introduced).
2646.0	2647.0	Oil shale: dark brownish gray and rare black (10YR 2/2-3/2, rare 1/2); common very slight satiny luster in lower part. Very faint smooth streaked bedding. Regular to rare irregular, thick to rare medium and thin parting; slight hackly to irregular fracture. A 1-inch medium brownish gray to brown, massive to faintly bedded band with some short tight vertical fractures at 2646.2 feet.
		<div style="border-left: 1px solid black; padding-left: 10px; margin-left: 20px;"> Sample of very dark slightly satiny oil shale from 2646.8 feet:  X-ray - illite, quartz, feldspar, dolomite, ferroan, pyrite. </div>
2647.0	2648.0	Oil shale: dark brownish gray (10YR 3/2-2/2); some very slight satiny luster in upper part. <u>Very</u> faint smooth to rare slightly distorted streaked bedding. Fairly regular to irregular, thick to rare medium and thin parting; irregular to coarse hackly fracture. Very rare very fine silty-textured pyrite streaks. A thin irregular dark dense cherty to glassy lens with some tar-stained fractures at 2647.7 feet.
2648.0	2650.0	Oil shale: dark and very rare medium brownish gray (10YR 3/2-2/2, rare 4/2). Very faint smooth streaked bedding and rare laminae. Irregular to some very regular, thick to thin parting; irregular to hackly fracture. An irregular 2-inch massive gray silty-textured stringer with common <u>very</u> fine disseminated pyrite (?) and rare fine oil shale stringers at 2648.5 feet; wavy bedding

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		in oil shale immediately above and below. A fine yellowish buff lamina and some very fine streaks at 2649.3 feet.
		[ Sample of gray silty-textured stringer from 2648.5 feet: X-ray - pyrite, feldspar, analcite.
		[ Sample of oil shale with fine buff lamina from 2649.3 feet: X-ray - mixed layer clay, quartz, ferroan, feldspar, dolomite, pyrite.
2650.0	2653.5	Oil shale: dark brownish gray (10YR & 2.5Y 3/2-2/2). Very faint smooth streaked bedding and rare laminae. Irregular to regular, thick to thin shaly parting; irregular hackly fracture. Rare very fine dense to crystalline streaks, blebs, and laminae. Very rare very fine silty-textured pyrite streaks in upper part. A fine gray silty-textured lamina at 2652.7 feet. A fine very light gray (very slight blue-green tint) fine grained lamina at 2653.1 feet. [ Sample of light gray lamina with some oil shale from 2653.1 feet: X-ray - mixed layer clay, ferroan; some quartz, feldspar, dolomite, pyrite.
2653.5	2654.5	Oil shale: dark to some medium brownish gray (10YR & 2.5Y 3/2-2/2, some 4/2-5/2 middle part). Very faint smooth streaked bedding; some distinct laminae in middle part. Regular to irregular, thick to thin parting; coarse to very slight hackly fracture. Some fine dark dense streaks and stringers in dark parts. Very rare very fine silty-textured pyrite streaks.
2654.5	2655.6	Oil shale: very dark brownish gray to rare black (10YR 2/2, rare 3/2 & 1/2); common slight satiny luster. Very faint smooth streaked bedding. Very regular to rare irregular, thick to thin parting; hackly to irregular fracture. Some very fine silty-textured pyrite streaks. Very rare very fine crystalline streaks. Some short <u>tight vertical fractures with resinous to vitreous black coatings.</u> [ Sample of very dark shale with some very fine silty-textured pyrite streaks from 2654.7 feet: X-ray - quartz, illite, pyrite, feldspar dolomite.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2655.6	2656.8	Oil shale: very dark brownish gray (10YR 2/2); some very slight satiny luster. Very faint smooth streaked bedding. Regular thick to thin shaly parting; hackly fracture. Rare fine black cherty streaks and blebs. A 2-inch dark brown fairly dense band with some tight vertical fractures at top; a 1-inch dark brown dense to very fine blebby textured band with some tight vertical fractures with waxy black coatings at 2656.4 feet. <div> Sample of dark brown dense to blebby band from 2656.4 feet:  X-ray - analcite, quartz, feldspar, dolomite, ferroan. </div>
2656.8	2657.8	Oil shale: very dark brownish gray (10YR & 2.5Y 2/2). Very faint smooth streaked bedding. Regular medium to thin shaly and some papery parting; hackly fracture.
2657.8	2661.9	Oil shale: dark to rare medium brownish gray (10YR & 2.5Y 2/2-3/2 & 3/1, rare 4/2-4/1 lower part). Very faint smooth streaked bedding and some laminae. Regular to some irregular, thick to thin shaly parting; hackly to slightly irregular fracture. Rare fine prismatic calcite streaks and laminae. Common very fine flat blebby molds and casts on parting surfaces in lower part (ostracods ?). <div> Sample of oil shale from 2660.6 feet:  X-ray - quartz, illite, pyrite, dolomite, calcite. </div>
2661.9	2663.4	Oil shale: medium to dark brownish gray (10YR 4/1 & 4/2-3/1 & 3/2, some 5/1-5/2 middle part, some 2/2 lower part). Faint smooth laminae and streaked bedding. Very regular to slightly irregular thick parting; slight hackly to fairly smooth fracture. Rare fine black organic (?) lenses in lower part. <div> Sample of medium to dark brownish gray oil shale from 2662.8 feet:  X-ray - quartz, calcite, pyrite, illite, dolomite. </div>
2663.4	2664.8	Oil shale: dark brownish gray to some black (10YR 3/2-2/2, some 1/2). Faint smooth streaked bedding and some very fine laminae. Very regular thick to medium parting; fine hackly fracture. Very common very fine to 1/4-inch streaks of

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		transparent prismatic calcite; common dark brown to black bitumen impregnations.
		Sample of prismatic calcite from 2664.5 feet: X-ray - Calcite, some quartz.
2664.8	2666.0	Oil shale: dark brownish gray (10YR 3/2-2/2); some very slight satiny luster. Faint smooth streaked bedding and some laminae; rare fine loop structures. Regular to slightly irregular, thin to thick shaly parting; hackly fracture. Rare very fine silty-textured pyrite streaks. A 1/2-inch faintly bedded dense brown band with some short tight vertical fractures with waxy black coatings at 2665.7 feet.
2666.0	2669.0	Oil shale: dark to some medium brownish gray (10YR 3/2, some 2/2 upper part, some 4/2 lower part). Very faint smooth streaked bedding and rare laminae. Regular to some irregular, thin to thick parting; hackly fracture. Rare fine columnar pyrite streaks. Rare very fine disseminated pyrite in upper part.
2669.0	2670.0	Oil shale: dark to medium brownish gray (10YR 3/2-4/2, rare 5/2 & 2/2). Faint to some moderately distinct smooth laminae and streaked bedding. Fairly regular to irregular, medium to thick parting; irregular very coarse hackly fracture. Some tight natural vertical fractures in upper part (vertical fractures have appeared frequently above, but were not recorded because there was no evidence of natural origin).
2670.0	2671.0	Oil shale: dark brownish gray (10YR & 7.5YR 3/2-2/2). Very faint to faint, smooth to rare distorted streaked bedding and rare laminae; rare small irregular loop structures. Irregular to some fairly regular, thick to medium parting; irregular fracture. A very fine irregular diagonal pyrite-filled fracture near top; a short diagonal glossy shear surface with very fine slickensides and some silty-textured pyrite at 2670.7 feet. A 1-1/4-inch faintly bedded to laminated brown band at base (probably like 2656.4 feet).
2671.0	2673.0	Oil shale: dark brownish gray to rare black (10YR 3/2-2/2, rare 1/2); rare satiny luster. Faint smooth streaked bedding and some laminae. Slightly irregular to very regular, thick to medium and rare thin shaly parting; hackly fracture.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corchole No. 1--Continued

From	To	Description
2673.0	2675.0	Common very fine to 1/8-inch prismatic calcite streaks in upper part. Some very fine silty-textured pyrite streaks in lower part. Oil shale: dark brownish gray (10YR 3/2 upper part, 3/2-2/2 lower part). Very faint to faint smooth streaked bedding and some laminae; a small overturned fold at 2674.4 feet. Slightly irregular to very regular, thick to medium parting; hackly to slightly irregular fracture. Rare very fine silty-textured pyrite streaks in upper part. Some fine resinous to waxy black streaks (fossils?) from 2673.6 to 2674.2 feet. Very rare very fine prismatic calcite streaks in lower part.
2675.0	2676.0	Oil shale: very dark brownish gray and rare black (10YR & 7.5YR 2/2, some 3/2, rare 1/2); rare slight satiny luster. Very faint smooth streaked bedding. Very regular to slightly irregular thick parting; irregular fracture. Rare fine resinous to waxy black streaks in upper part. An irregular short tight high angle fracture with rare very fine orangish brown calcite crusts in middle. A 1-inch dense dark brownish gray band with common short tight bitumen-impregnated vertical fractures at 2676.8 feet.
2676.0	2679.0	Oil shale: very dark brownish gray (10YR & 7.5YR 2/2, some 3/2). Faint very slightly distorted to smooth streaked bedding. Fairly regular to irregular thick parting; slightly irregular to irregular fracture. Common fine dense dark brown streaks and lenses (appear much lighter and distinct on sawed and cored surfaces). A fine waxy to vitreous black organic streak at 2678.1 feet. (2676.9-2678.0 missing).
2679.0	2681.0	Oil shale: dark brownish gray (7.5YR & 10YR 2/2-3/2); common very fine satiny to resinous streaks near base. Faint smooth to some slightly distorted streaked bedding. Slightly irregular to regular, thick to some medium and thin parting; slightly irregular to hackly fracture.
2681.0	2682.0	Oil shale: dark brownish gray to rare black (10YR & 7.5YR 2/2-3/2, rare 1/2); common satiny to some resinous luster. Faint smooth to distorted laminae and streaked bedding (fairly distinct on sawed surfaces); common fine to fairly large loop structures and displacements. Regular to slightly

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		irregular and wavy, thin to thick parting; hackly to irregular fracture. Rare very fine crystalline streaks and pyrite blebs in upper part.
		Sample of satiny to resinous oil shale from 2681.9 feet:
		X-ray - feldspar, ferroan, quartz, analcite.
2682.0	2683.0	Oil shale: very dark brownish gray to some black (10YR & 7.5YR 2/2, some 1/2, rare 3/2); rare very fine satiny to resinous streaks. Very faint smooth streaked bedding and some very fine laminae. Very regular to some irregular, thin to medium parting; hackly fracture. A 1-1/2-inch yellowish buff to brownish gray, earthy to dense crystalline stringer with some fine oil-shale stringers at 2682.6 feet; some short irregular vertical fractures.
		Sample of yellowish buff earthy material from stringer at 2682.6 feet:
		X-ray - dolomite, quartz, illite, pyrite, feldspar.
2683.0	2686.0	Oil shale: dark to some medium brownish gray (10YR 3/2, some 4/2 middle part, rare 2/2). Faint smooth streaked bedding and some laminae; rare fine loop structures and displacements. Irregular to very regular, thick to thin parting; hackly to irregular fracture. Rare very fine pyrite streaks. An irregular diagonal glossy shear surface with very fine slickensides at 2684.0-2684.2 feet. A natural (??) vertical fracture extends from 2684.6 to 2686.6 feet.
2686.0	2687.0	Oil shale: dark to rare medium brownish gray and black (10YR 3/2-2/2, very rare 4/2 upper part, rare 1/2 lower part). Faint smooth streaked bedding and some laminae. Very regular to some irregular, thin to medium parting; hackly fracture. Rare very fine dark crystalline streaks.
2687.0	2688.0	Oil shale: dark brownish gray and very rare black (10YR 2/2, some 3/2, rare 1/2 upper part). Faint smooth laminae and streaked bedding. Irregular to regular, thick to rare thin parting; irregular to very coarse hackly fracture. Common very short tight bitumen-impregnated vertical fractures in upper part; a natural (??) vertical fracture extends from 2687.5 into interval below. Rare very fine silty-textured pyrite streaks.
2688.0	2690.0	Oil shale: very dark brownish gray (10YR 2/2, some 3/2-3/1). Very faint smooth streaked bedding and some laminae. Very regular to some irregular, thick to thin shaly parting; coarse hackly fracture.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Rare to fairly common very fine silty-textured pyrite streaks. Very rare fine waxy to vitreous black organic streaks. Natural (??) vertical fracture continues through interval.
2690.0	2692.0	Oil shale: dark brownish gray (10YR 2/2-3/2 & 3/1). Faint smooth streaked bedding and some laminae. Regular to irregular, medium to thin shaly parting; irregular hackly fracture. Some very fine pyrite streaks. Natural (??) vertical fracture continues through interval. Some parts badly broken up and mixed up; original footage measurements probably reliable.
2692.0	2694.0	Oil shale: dark brownish gray (10YR 2/2-3/2); Rare slightly satiny luster near base. Faint smooth streaked bedding. Very regular to slightly irregular, medium to thin shaly and some papery parting; hackly fracture. A very thin very pyritic gray stringer at 2693.7 feet.
2694.0	2696.3	Oil shale: very dark brownish gray to black (10YR 2/2-1/2, some 3/2 upper part); common very slight satiny luster. Faint to <u>very</u> faint smooth streaked bedding and rare laminae; some smoothly curved in upper part. Very regular to some irregular and rare curved, thin to thick shaly parting; hackly fracture. Thick tapered dense brownish gray to almost neutral gray bands with very faint converging bedding at 2694.4 feet (1 to 3 inches thick) and 2694.8 feet (1 to 2 inches thick); bands thin in same direction; some very fine short bitumen-impregnated fractures in lower band. Some very fine discontinuous vermiform pyrite stringers at 2695.5-2695.7 feet. Sample of hard dense gray band from 2694.8 feet: X-ray - dolomite.
2696.3	2699.5	Oil shale: dark brownish gray (10YR 2/2-3/2, some 3/1 middle part.) Faint smooth laminae and streaked bedding. Regular to irregular, thick to thin shaly parting; hackly fracture. Rare short irregular high angle glossy shear surfaces with very fine slickensides near top. Very rare fine waxy black organic streaks and blebs in upper part. A thin dense gray band at 2698.1 feet. One or more vertical fractures through most of interval--probably induced in coring.
2699.5	2702.0	Oil shale: very dark brownish gray to black (10YR 2/2-1/2); common slight satiny luster. Very faint smooth streaked bedding. Very smooth to rare irregular, thick to thin shaly parting; slight

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		some coarse hackly fracture. Rare to fairly common <u>very</u> fine silty-textured pyrite streaks. A diagonal fracture with irregular vitreous black organic crusts at 2700.8-2701.0 feet. A very irregular low angle very glossy shear surface at 2701.5 feet. A 1/2- to 1-inch pinched very dark brownish gray silty-textured stringer at 2701.8 feet.
		[ Sample of very dark brownish gray stringer from 2701.8 feet: X-ray - sanidine.
2702.0	2703.0	Oil shale: dark brownish gray (10YR 2/2-3/2); nearly all has satiny to resinous luster. Very faint smooth and rare distorted streaked bedding. Very smooth to slightly irregular and "curly", thick to thin parting; hackly fracture. Some very fine silty-textured pyrite streaks.
2703.0	2706.0	Oil shale: dark brownish gray to black (10YR 3/2-1/2); some very slight satiny luster. Faint smooth laminae and streaked bedding; very rare fine loop structures. Smooth to some slightly irregular and wavy, thick to thin shaly parting; coarse to slight hackly fracture. Some very fine silty-textured pyrite streaks.
		[ Sample of dark brownish gray to black oil shale from 2703.6 feet: X-ray - quartz, illite, dolomite, ferroan, feldspar, pyrite, montmorillonite?
2706.0	2708.3	Oil shale: dark brownish gray (10YR 3/2-2/2). Faint smooth laminae and streaked bedding. Very regular to rare irregular, thick to thin shaly parting; hackly to slightly irregular fracture. Rare very fine silty-textured pyrite streaks. Some fine prismatic calcite streaks in upper part.
		[ Sample of dark brownish gray oil shale from 2706.4 feet: X-ray - quartz, illite, dolomite, calcite, feldspar, pyrite.
2708.3	2709.3	Oil shale: dark to some medium brownish gray (10 YR & 7.5YR 3/2-2/2, some 5/2 lower part). Faint to moderately distinct, smooth to very slightly distorted streaks and laminae. Slightly irregular thick parting; irregular to slightly conchoidal fracture.
2709.3	2710.4	Oil shale: dark to medium brownish gray and brown (7.5YR & 10YR 3/2 & 3/3-4/2 & 4/3, rare 2/2 & 5/3, rare 2.5Y 3/2-4/2). Moderately distinct slightly distorted to very distorted streaks and stringers.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Slightly irregular to irregular thick parting; slightly conchoidal to irregular fracture. Very rare very fine black pyritic streaks with rare calcite crystals. A 3/4-inch medium to light brownish gray band with very common very fine yellowish buff blebs and streaks and some tight brown stained vertical fractures at top. Very abrupt conformable change to dark shale at base.
		[ Sample of brownish gray band with very fine yellowish buff blebs and streaks from 2709.3 feet: X-ray - dolomite, quartz, pyrite, feldspar, illite.
		[ Sample of dark to medium brownish gray and brown oil shale from 2710.2 feet: X-ray - dolomite, quartz; some feldspar, illite.
2710.4	2712.7	Oil shale: dark brownish gray (10YR 3/1 & 3/2-2/1 & 2/2); some very fine satiny streaks in upper part. Very faint smooth streaked bedding and some laminae. Very regular to slightly irregular, medium to thick parting; hackly fracture. Common fine prismatic calcite streaks at 2711.3-2711.7 feet. Very rare fine dense black cherty lenses in lower part.
		[ Sample of very dark grayish shale from 2710.7 feet: X-ray - quartz, illite, pyrite, feldspar.
2712.7	2713.7	Oil shale: dark brownish gray (10YR & 2.5Y 3/2); some satiny to rare resinous luster. Very faint contorted (upper 0.3 foot) to smooth streaked bedding. Very irregular "curly" parting with glossy surfaces in upper 0.3 foot; regular medium to thick parting in lower part; hackly fracture. Rare fine calcite streaks in upper part. A fine yellowish buff to light gray lamina at 2713.0 feet. Very rare fine black cherty lenses.
2713.7	2715.0	Oil shale: dark to rare medium brownish gray (10YR & 2.5Y 3/2-3/1, rare 4/1). Faint smooth streaked bedding and some very fine laminae. Regular to rare irregular, medium to thick parting; slight hackly fracture. Rare very fine vitreous black organic streaks. Very rare fine black cherty lenses.
2715.0	2717.8	Oil shale: dark to rare medium brownish gray (10YR & 2.5Y 3/1 & 3/2, some 2/1, rare 4/1). Very faint smooth to rare slightly distorted streaked

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

## Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		bedding. Regular to very irregular, thick to thin shaly and some papery parting; very irregular coarse to fine hackly fracture. Rare fine irregular calcite-filled fractures in upper part; rare irregular tight fractures with common very fine pyrite in lower part. A thick faintly laminated dense brownish gray band with some irregular fractures with fine radiating silky spots at 2716.0-2716.4 feet; rare thin to fine dense brownish gray bands in lower part.
		Sample of dense fractured band with very fine white silky spots from 2716.0-2716.4 feet: X-ray - dolomite, trace quartz.
2717.8	2718.8	Oil shale: dark brownish gray to black (10YR 3/2-1/2); some very slight satiny luster. Very faint smooth to rare slightly distorted streaked bedding and some laminae. Regular to some irregular, medium to thick parting; hackly to fairly smooth fracture. Some fine silty-textured pyrite streaks. Common fine distorted dense medium to light brownish gray laminae at 2718.0-2718.1 feet. Some very fine resinous black streaks at 2718.5 feet.
2718.8	2720.0	Oil shale: very dark brownish gray to black (10YR 2/2-1/2); some very slight satiny luster. Very faint smooth streaked bedding. Slightly irregular to very regular, thick to rare thin parting; hackly fracture. Some very fine silty-textured pyrite streaks.
2720.0	2721.0	Oil shale: dark brownish gray and rare black (10YR 2/2-3/2 & 3/1, rare 1/2 upper part); some very fine satiny to waxy streaks. Very faint smooth streaked bedding. Very regular to slightly irregular, thick to thin parting; hackly fracture. Very rare very fine silty-textured pyrite streaks in upper part.
2721.0	2724.2	Oil shale: dark to some medium brownish gray (10YR 3/1-2/2, some 4/1 lower part). Faint smooth streaked bedding. Regular to irregular, thick to thin parting; irregular hackly fracture. Some very fine resinous black streaks (fossil fragments?). Some short tight bitumen-coated fractures at 2722.6 feet.
2724.2	2726.5	Oil shale: dark brownish gray to some black (10YR 3/2 & 3/1-2/2, some 1/2); rare very slight satiny luster. Very faint smooth to some distorted streaked bedding. Regular to irregular, thin to thick parting; hackly fracture. Some very fine

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# LITHOLOGIC DESCRIPTION OF SAMPLES FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		resinous black streaks (fossil fragments?). Some very distorted brownish gray to buff and rare gray-buff silty to blebby stringers at 2724.9-2725.0 and 2725.5-2725.7 feet. Rare very fine silty-textured pyrite streaks in lower part.
2726.5	2727.5	<p>Sample of oil shale with brownish gray to gray-buff stringers from 2724.9 feet:  X-ray - mixed layer clay, quartz, feldspar.</p> <p>Oil shale: dark brownish gray (10YR 3/1 &amp; 3/2-2/1). Very faint slightly distorted to smooth streaked bedding. Slightly irregular to very irregular, thick to very thin parting; irregular hackly fracture. Some black fossil (?) fragments on parting surfaces. Some thin to fine dense dark brownish gray bands with short tight bitumen-filled fractures.</p>
2727.5	2732.7	Oil shale: dark to medium brownish gray (10YR & 2.5Y 3/1 & 3/2-4/1 & 4/2). Very faint smooth streaked bedding and some laminae. Regular to irregular, thin to rare thick shaly parting; irregular hackly fracture. Fairly common resinous black fossil fragments. Rare fine massive pyrite blebs in lower part.
2732.7	2733.7	Oil shale: medium to dark brownish gray (2.5Y 4/1 in upper part to 10YR 3/2 in lower part). Faint smooth streaked bedding. Very irregular to some regular, medium to thin parting; very irregular hackly fracture. Very rare fine pyrite blebs.
2733.7	2736.2	<p>Sample of shale from 2732.8 feet:  X-ray - quartz, illite, dolomite, ferroan, pyrite, feldspar.</p> <p>Oil shale: very dark brownish gray to black (10YR 2/2-1/2); common satiny luster. Very faint smooth streaked bedding. Very regular to rare irregular and wavy, thick to thin shaly parting; hackly fracture. Some very fine silty-textured pyrite streaks. A 1/2-x 1-1/2 inch resinous black organic (?) lens with very fine silty-textured pyrite rims and streaks at 2735.7 feet. A 1-inch dark brownish gray silty-textured to very fine crystalline stringer at 2735.9 feet.</p> <p>Sample of resinous black lens from 2735.7 feet:  X-ray - pyrite, apatite.</p> <p>Sample of dark brownish gray silty to very fine crystalline stringer from 2735.9 feet:  X-ray - sanidine, ferroan, pyrite.</p>

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2736.2	2737.2	Oil shale: dark brownish gray and rare black (10YR 2/2-3/2, rare 1/2 upper part); rare satiny luster in upper part. Faint smooth streaked bedding. Regular to some irregular, thick to thin parting; coarse hackly fracture. Some very fine silty-textured pyrite streaks and blebs. Some thin resinous black lenses with pyritic rims near top. A thin irregular dense dark brownish gray band at 2736.4 feet.
2737.2	2738.3	Oil shale: dark to some medium brownish gray (10YR 3/2-2/2, some 4/2). Faint smooth streaked bedding. Regular to irregular, thin to thick parting; irregular hackly fracture. Rare very fine silty-textured pyrite streaks. Very rare very fine medium to light brownish gray crystalline streaks in lower part.
2738.3	2742.7	Oil shale: dark to medium brownish gray (10YR & 2.5Y 3/2-4/2). Faint smooth to rare slightly distorted streaked bedding. Regular to irregular, thick to thin shaly parting; hackly to some slightly irregular and conchoidal fracture. Rare fine black pyritic blebs and streaks in upper part. A thin gray silty-textured very pyritic band at 2739.2 feet. A short irregular high angle glossy shear surface at 2742.5 feet. Very rare black fossil (?) fragments.
		Sample of thin gray pyritic band from 2739.2 feet: X-ray - pyrite, some feldspar.
2742.7	2748.2	Oil shale: dark to medium brownish gray (10YR & 2.5Y 3/2 & 3/1-4/2 & 4/1). Faint smooth to rare slightly distorted streaked bedding. Regular to very irregular, thin to some medium and rare thick parting; very irregular hackly fracture; breaks up very badly on splitting. Very rare fine brown crystalline streaks in lower part.
2748.2	2749.6	Oil shale: dark brownish gray to rare black (10YR 3/2-2/2, rare 1/2). Faint slightly distorted to smooth streaked bedding and rare laminae. Irregular to some regular, thick to rare thin parting; hackly to slightly irregular fracture. Rare fine pyritic streaks and stringers. Very rare fine dark brownish gray crystalline stringers and streaks.
2749.6	2750.6	Oil shale: dark brownish gray (10YR 3/2-2/2). Faint smooth streaked bedding. Very irregular thick to thin parting; irregular hackly fracture. Rare black fossil (?) fragments.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2750.6	2752.4	Oil shale: very dark brownish gray to some black (10YR 2/2, some 1/2, rare 3/2). Faint smooth to rare slightly distorted streaked bedding. Regular to irregular, thick to thin parting; coarse to slight hackly fracture. Rare to common very fine pyrite streaks and blebs. Rare very thin to 3/4-inch resinous black lenses (like 2735.7 feet).
2752.4	2753.9	Oil shale: dark to some medium brownish gray (10YR & 2.5Y 3/2-3/1, some 2/2 & 4/2-4/1). Faint slightly distorted to smooth streaked bedding. Irregular to some regular, thick to thin parting; very irregular hackly fracture. A 1-inch distorted gray very pyritic stringer at top (like 2739.2 feet).
2753.9	2757.5	Oil shale: dark to medium to medium brownish gray (10YR & 2.5Y 3/1 & 3/2-4/1 & 4/2, rare 5/1-5/2). Faint smooth streaked bedding and some very fine laminae. Very irregular to rare regular, thick to thin parting; very irregular hackly fracture; breaks up very badly on splitting. Faintly bedded to laminated dense medium to light brownish gray dolomite bands at 2754.3-2754.9 and 2757.1-2757.3 feet.
2757.5	2758.5	Oil shale: dark to medium brownish gray (2.5Y & 10YR 3/1 & 3/2-4/1 & 4/2). Faint smooth streaked bedding and some laminae. Regular to some irregular, thick to medium and rare thin parting; hackly fracture.
2758.5	2759.8	Oil shale: dark and rare medium brownish gray (2.5Y & 10YR 3/2-2/2, rare 4/2 middle part). Faint smooth streaked bedding. Slightly irregular to very regular, thick to some thin shaly parting; fine hackly fracture. Rare black fossil fragments (fish?). Rare small resinous black organic (?) lenses.
2759.8	2762.3	Oil shale: dark to rare medium brownish gray (10YR & 2.5Y 3/2, some 2/2 upper part, rare 4/2 lower part). Faint smooth streaked bedding. Regular to irregular, thick to rare thin parting; slight to some coarse hackly fracture. Some black fossil fragments (rare vertebrae and ribs).
2762.3	2764.9	Oil shale: dark brownish gray (10YR 2/2-3/2). Faint smooth streaked bedding. Regular to some irregular, thin to thick shaly and rare papery parting; hackly fracture. Some very fine silty-textured pyrite streaks and blebs. Occasional fine resinous black organic streaks to 1/2-inch

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2764.9	2765.8	lenses. A 1-inch dense brownish gray dolomite (?) band at 2763.5 feet. Dolomite (?) and some oil shale: dark brownish gray and rare dark brown dolomite (10YR 3/2, rare 3/3 upper part). Faint smooth to distorted bedding in upper part to massive in lower part; dense irregular thick parting; irregular to conchoidal fracture. Some irregular tight bitumen-filled fractures. Dark brownish gray oil shale with some glossy shear surfaces with very fine slickensides at 2765.0-2765.2 feet. [ Sample of dark brownish gray dolomite (?) from 2765.6 feet: X-ray - dolomite.
2765.8	2767.3	Oil shale: dark brownish gray (10YR 2/2-3/2). Faint smooth streaked bedding. Irregular to regular, thin to thick shaly parting; hackly fracture. Some very fine silty-textured pyrite streaks. Very rare small black organic lenses. Some irregular glossy shear surfaces with very fine slickensides near top. A 1-inch faintly bedded dense dark brownish gray dolomite band with irregular bitumen-filled fractures at 2766.5 feet.
2767.3	2768.3	Oil shale: dark to rare medium brownish gray (10YR & 2.5Y 2/2-3/2 & 3/1). Faint smooth streaked bedding. Regular to irregular, thin to medium shaly and some papery parting; hackly fracture.
2768.3	2772.0	Shale: dark to rare medium brownish gray (2.5Y 10YR 3/1 & 3/2, rare 4/1). Faint smooth streaked bedding. Very irregular thick to thin parting; very irregular fracture; breaks up very badly on splitting. Rare dense massive dolomite bands. Some fine broken very light yellowish buff earthy laminae at 2769.5 feet.
2772.0	2774.0	Shale: medium to dark brownish gray (2.5Y & 10YR 4/1-3/1). Faint smooth streaked bedding. Very irregular thick to thin parting; very irregular to some very conchoidal fracture; breaks up very badly on splitting. [ Sample of shale from 2773.7 feet: X-ray - illite, quartz, dolomite, ferroan, pyrite, feldspar.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2774.0	2776.0	Oil shale: medium to dark brownish gray (2.5Y 4/2 & 4/1-3/2). Faint smooth bedding. Very irregular to fairly regular, thick to thin parting; very irregular hackly fracture.
2776.0	2777.6	Oil shale: dark brownish gray (2.5Y 3/2). Faint smooth bedding and rare laminae. Regular to irregular, thick to thin parting; hackly fracture.
2777.6	2779.0	Oil shale: dark brownish gray (10YR 3/2; rare 2/2). Faint smooth streaked bedding. Slightly irregular to very regular, medium to thick and rare thin parting; slightly hackly fracture. Rare fine silty-textured to massive pyrite streaks and blebs.
2779.0	2780.0	Oil shale: dark brownish gray (10YR 3/2-2/2). Faint smooth streaked bedding. Regular thick parting; fine hackly fracture. Rare very fine silty-textured pyrite streaks. Some very fine dense dark brownish gray blebs and streaks in lower part. Rare very fine black fossil fragments. <div style="margin-left: 40px;">Sample of dark brownish gray shale with some very fine dark dense blebs from 2779.9 feet:  X-ray - quartz, dolomite, pyrite, illite, feldspar.</div>
2780.0	2781.0	Oil shale: very dark brownish gray to some black (10YR 2/2, some 1/2); rare very slight satiny luster. Faint smooth streaked bedding. Regular to rare irregular, thick to some thin parting; slight hackly fracture. Rare very fine silty-textured pyrite streaks and blebs. Some very fine dark dense blebs and streaks in upper part. Very rare very fine black fossil fragments. <div style="margin-left: 40px;">Sample of very dark brownish gray to black oil shale from 2780.9 feet:  X-ray - dolomite, quartz, illite, pyrite, feldspar.</div>
2781.0	2782.0	Oil shale: dark brownish gray and rare black (10YR 2/2-3/2, rare 1/2 upper part). Faint smooth streaked bedding. Regular to some irregular, thick to thin parting; hackly fracture. Fairly common very fine silty-textured pyrite streaks, blebs, and stringers. Rare very fine fossil fragments.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2782.0	2783.3	Oil shale: dark to some medium brownish gray (10YR 3/2-2/2, some 4/2 lower part). Faint smooth streaked bedding and rare laminae. Regular to irregular, thick to thin parting; irregular hackly fracture. Very rare fine silty-textured pyrite streaks. A 1-inch faintly laminated dense medium to light brownish gray dolomite band at 2783.2 feet.
2783.3	2785.0	Oil shale: medium to dark brownish gray (2.5Y & 10YR 4/2 & 4/1-3/2 & 3/1, some 5/2-5/1 lower part). Faint to rare distinct, smooth to rare slightly distorted laminae and streaked bedding. Irregular very thin to rare thick parting; hackly to very irregular fracture. Rare very fine tight irregular pyrite-filled fractures in upper part; some vertical fractures with resinous brown coatings in lower part. <div style="margin-left: 2em;">Sample of laminated shale from 2784.7 feet:  X-ray - quartz, illite, mixed layer clay?, dolomite, ferroan, feldspar.</div>
2785.0	2786.4	Oil shale: dark to some medium brownish gray and black (10YR 3/2-2/2, some 4/2 & 1/2). Faint smooth streaked bedding. Regular to some irregular, thick to thin parting; very slight to coarse hackly fracture. Rare very fine crystalline streaks and blebs.
2786.4	2788.4	Oil shale: very dark brownish gray to black (10YR 2/2-1/2, rare 3/2 upper part). Faint smooth streaked bedding. Regular to slightly irregular, thick to rare medium and thin parting; slight to some fairly coarse hackly fracture. Common very fine disseminated crystals in upper part; some very fine crystalline streaks in lower part. Some fine dark dense streaks and stringers in lower part (like 2779.9 feet?). Rare very fine silty-textured pyrite streaks and blebs. <div style="margin-left: 2em;">Sample of black oil shale with very fine disseminated crystals from 2786.5 feet:  X-ray - quartz, illite, dolomite, feldspar, analcite, ferroan.</div>
2788.4	2794.0	Oil shale: dark to medium brownish gray (10YR 3/2 & 3/1-4/2 & 4/1, some 2/2 near top). Faint smooth streaked bedding and rare laminae. Irregular medium to thin parting; very irregular hackly fracture; breaks up very badly on splitting. Very rare low angle glossy shear surfaces with very fine slickensides.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2794.0	2795.0	Oil shale: very dark brownish gray to rare black (10YR 2/2, some 3/2, rare 1/2). Faint smooth streaked bedding. Slightly irregular and wavy to very regular, medium to thick parting; irregular hackly fracture. Rare very fine silty-textured pyrite streaks and short irregular vertical stringers (fracture fillings). An irregular 1-inch dense dark brownish gray dolomite nodule with irregular very light colored pyrite rims and very fine fracture fillings at top.
2795.0	2798.0	Oil shale: dark brownish gray (10YR 2/2-3/2). Faint smooth streaked bedding. Regular to irregular, thick to medium parting; very irregular coarse to slight hackly fracture. Rare fine pyrite streaks and blebs. A very fine irregular tight vertical fracture with very common silty-textured pyrite extends through most of upper foot. Rare diagonal glossy shear surfaces.
2798.0	2800.0	Oil shale: very dark brownish gray to some black (10YR 2/2, some 1/2, rare 3/2). Very faint smooth and rare distorted streaked bedding. Smooth and some curved to rare irregular, thick to some thin parting; irregular coarse to slight hackly fracture. Some fine silty-textured pyrite streaks and stringers. Some irregular 1/2- to 3/4-inch horizontal tubular very pyritic silty-textured nodules or stringers at 2798.2 feet. Rare thin dense dark brownish gray dolomite bands in upper part. A thin dark dense to very fine crystalline stringer at 2799.1 feet (like 2735.9 feet?).
		Sample of very pyritic nodules from 2798.2 feet:
		X-ray - pyrite.
2800.0	2801.6	Oil shale: dark brownish gray (10YR 2/2-3/2). Faint smooth to some slightly distorted streaked bedding. Regular to irregular, medium to very thin shaly parting; hackly fracture. Rare thin zones with common very fine disseminated crystals. Rare black fossil fragments. Some irregular vertical fractures with silty-textured pyrite in lower part.
2801.6	2805.0	Oil shale: dark brownish gray to rare black (10YR 2/2-3/2, rare 1/2 near base). Faint smooth streaked bedding. Irregular to regular, thick to thin parting; irregular hackly fracture. Some very fine silty-textured pyrite streaks, stringers,

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		and fracture fillings. A 2-inch dense faintly bedded band at top. Rare fine dark silty streaks and stringers in lower part.
2805.0	2806.0	Oil shale: very dark brownish gray to black (10YR 2/2-1/2); some very slight satiny luster. Very faint smooth bedding. Regular thick parting; irregular to hackly fracture. Some very fine silty-textured pyrite streaks and stringers. Very rare fine dark silty streaks and stringers.
2806.0	2809.0	Oil shale: Very dark brownish gray to some black (10YR 2/2, some 3/2 & 1/2). Faint smooth bedding. Regular to some irregular, thin to thick shaly parting; hackly to slightly irregular fracture. Some <u>very</u> fine silty-textured pyrite streaks. Rare short tight vertical fracture with vitreous black organic fillings in upper part. Rare fine black cherty streaks near base.
2809.0	2813.0	Oil shale: dark brownish gray to rare black (10YR 2/2-3/2, rare 1/2 upper and lower parts). Faint smooth streaked bedding. Regular to irregular, thick to thin shaly parting; slight to coarse irregular hackly fracture. Rare very fine silty-textured pyrite streaks, stringers, and fracture fillings. Very rare fine black cherty streaks and blebs in upper part.
2813.0	2814.0	Oil shale: very dark brownish gray to some black (10YR 2/2, some 1/2). Very faint smooth streaked bedding. Regular to some irregular, thick to thin shaly parting; hackly to slightly irregular fracture. Rare very fine silty-textured pyrite streaks.
2814.0	2815.0	Oil shale: black to dark brownish gray (10YR 1/2-2/2, some 3/2 lower part). Very faint to faint smooth streaked bedding. Slightly irregular medium to thick parting; slight hackly to irregular fracture. Very rare very fine dark silty streaks. A very fine vermiform vertical silty-textured pyrite stringer near top.
		[ Sample of black shale with rare fine dark silty streaks from 2814.2 feet: X-ray - quartz, illite, dolomite, feldspar, ferroan, mixed layer clay?

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2815.0	2818.2	Oil shale: dark brownish gray (10YR 2/2-3/2). Faint smooth to some distorted streaked bedding. Regular to some irregular, thick to medium and rare thin parting; irregular slight hackly fracture. Some fine to 1-inch dense dark brownish gray lenses, stringers, and inclusions. Rare fine silty-textured pyrite streaks and fracture fillings in upper part. Sample of thin dense dark brownish gray inclusion from 2817.9 feet: X-ray - dolomite; trace quartz, feldspar.
2818.2	2820.5	Oil shale: dark brownish gray to rare black (10YR 2/2-3/2, rare 1/2). Faint smooth to distorted and displaced streaked bedding and some laminae. Regular to irregular, thin to rare thick shaly parting; irregular hackly fracture. Common dense dark to medium brownish gray dolomite laminae and rare thin bands; rare very short tight bitumen-filled vertical fractures in dolomite laminae and bands. Rare irregular diagonal glossy shear surfaces with very fine slickensides in lower part.
2820.5	2826.0	Oil shale (?): dark brownish gray (10YR 2/2-3/2 & 3/1). Very faint smooth to rare distorted bedding. Slightly irregular to very irregular, thin to medium and rare thick shaly parting; very irregular hackly fracture; breaks up very badly on splitting. Some very fine crystalline streaks. A 2-inch dense massive medium brownish gray dolomite band at 2820.7 feet. Sample of shale with some very fine crystalline streaks from 2822.5 feet: X-ray - quartz, illite, ferroan, dolomite, feldspar.
2826.0	2832.0	Shale: dark to medium brownish gray (10YR & 2.5Y 3/1-4/1, rare 3/2-2/2; commonly almost neutral gray). Very faint smooth to rare slightly distorted bedding. Irregular thin to medium parting; very irregular hackly fracture; breaks up very badly on splitting. Some very fine crystalline streaks.
2832.0	2834.0	Shale: dark to medium gray (N 3-4; some slight brown tint). Very faint smooth bedding. Irregular thin to medium parting; very irregular hackly fracture; breaks up very badly on splitting. Some very fine crystalline streaks.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of dark gray shale from 2833.1 feet: X-ray - quartz, illite, dolomite, feldspar, ferroan, pyrite.
2834.0	2840.0	Shale: dark to medium brownish gray (10YR & 2.5Y 3/1-4/1, rare 3/2-2/2). Very faint smooth bedding. Irregular shaly to papery parting; very irregular hackly fracture; breaks up very badly on splitting. Rare very fine crystalline streaks.
2840.0	2844.0	Shale: dark brownish gray (10YR 3/2-3/1). Very faint smooth bedding. Irregular shaly to papery parting; very irregular hackly fracture; breaks up very badly on splitting.
2844.0	2848.0	Oil shale: dark brownish gray (10YR 3/2-2/2, some 3/1-2/1 lower part). Very faint smooth bedding. Irregular shaly to paper parting; hackly fracture; breaks up very badly on splitting. Some thick dense heavy dolomite bands. Very rare fine crystalline streaks.
		Sample of papery shale from 2846.3 feet: X-ray - quartz, illite, dolomite, feldspar.
2848.0	2850.0	Oil shale: dark brownish gray (10YR 2/2 & 2/1-3/2 & 3/1). Very faint smooth bedding. Irregular shaly to papery parting; hackly fracture; breaks up on splitting. Rare fine black fossil fragments. Thick dense dolomite bands with tight vertical bitumen-coated fractures at 2848.8 and 2849.5 feet.
2850.0	2852.0	Shale: dark to some medium brownish gray (10YR & 2.5Y 3/1 & 3/2, some 4/1-4/2). Faint smooth to rare slightly distorted bedding. Irregular thin to thick shaly parting; hackly to irregular fracture; breaks up on splitting. Common dense dark to medium brownish gray dolomite laminae; a 1-inch dense light to medium brownish gray band with some tight vertical fractures with rare fine white silky radiating spots at 2850.5 feet. Very rare fine black fossil fragments.
		Sample of dense light to medium brownish gray band from 2850.5 feet: X-ray - dolomite; trace quartz, feldspar.
2852.0	2853.7	Missing.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

## Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2853.7	2855.7	Oil shale: dark to some medium brownish gray (10YR 3/2-2/2, some 4/2). Very faint smooth bedding. Irregular to very regular, thin to thick parting; coarse to very slight hackly fracture. Some thick dense to blebby, massive to faintly bedded, dark brownish gray to medium brown bands and rare irregular stringers. Sample of blebby stringer with common fine crystals and some oil-shale streaks from 2855.6 feet.
2855.7	2857.0	X-ray - calcite, quartz, dolomite, illite. Oil shale: dark brownish gray (10YR 3/2-2/2). Very faint smooth bedding. Regular to some irregular, thin to medium and rare thick shaly parting; coarse to slight hackly fracture. Rare fine crystalline streaks in lower part. Sample of oil shale from 2856.1 feet: X-ray - quartz, illite, pyrite, calcite, dolomite, feldspar, extra peak at 29.8° 2θ.
2857.0	2859.0	Oil shale: dark to some medium brownish gray (10YR 3/2, some 3/1-4/1, rare 2/2). Very faint smooth bedding. Irregular to regular, papery to medium and rare thick parting; hackly to rare slightly irregular and conchoidal fracture; some breaks up on splitting. A 1/2-inch fine grained calcite band at 2857.1 feet. A vertical fracture with dark brown to black resinous coatings at 2858.2-2858.5 feet.
2859.0	2862.0	Oil shale: dark to medium brownish gray (10YR 3/2 & 3/1-4/2 & 4/1). Very faint smooth bedding and rare laminae. Regular to irregular, thick to some thin parting; slightly irregular to hackly fracture.
2862.0	2866.0	Oil shale: dark brownish gray (10YR 3/2-2/2). Very faint smooth bedding. Regular to irregular, thick to thin shaly parting; slightly irregular to coarse hackly fracture. Some to rare very fine silty-textured pyrite streaks. Very rare thin calcite streaks--some prismatic. Bitumen-coated vertical fractures at 2862.5-2862.7 and 2864.7-2865.7 feet. Some ostracods (?) on parting surfaces. Sample of prismatic calcite streak with some oil shale from 2864.6 feet: X-ray - calcite; trace quartz, dolomite.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2866.0	2868.0	Oil shale: dark brownish gray (10YR 3/2, some 2/2 upper part). Faint smooth bedding. Regular to irregular, shaly to papery parting; hackly fracture; breaks up on splitting. Common ostracods on parting surfaces.
2868.0	2869.5	Oil shale: dark brownish gray (10YR 3/2). Very faint smooth bedding. Regular to irregular, thick to thin shaly parting; hackly fracture. Common ostracods. Some very fine silty-textured pyrite streaks and blebs. <div style="margin-left: 40px;">Sample of oil shale with common ostracods from 2868.7 feet:  X-ray - quartz, illite, calcite, pyrite, dolomite.</div>
2869.5	2870.8	Oil shale: dark brownish gray to some black (10YR 3/2-2/2, some 1/2). Very faint smooth streaked bedding. Irregular thin to thick shaly parting; very irregular hackly fracture; breaks up on splitting. Some fine resinous black fossil fragments. Rare fine silty-textured pyrite streaks and stringers. Some thin to 1-inch dense dark brownish gray dolomite bands in lower part.
2870.8	2873.0	Oil shale: very dark brownish gray to black (10YR 2/2-1/2). Very faint smooth to slightly distorted streaked bedding. Slightly irregular to very irregular, thick to medium parting; very irregular hackly fracture. Common fine resinous black fossil fragments. Common very fine silty-textured pyrite streaks, stringers, and very irregular fracture fillings. <div style="margin-left: 40px;">Sample of very dark brownish gray to black shale with some fossil fragments and pyrite from 2871.2 feet:  X-ray - quartz, illite, dolomite, feldspar, ferroan, pyrite.</div>
2873.0	2874.4	Oil shale: dark brownish gray (10YR 3/2-2/2). Faint smooth streaked bedding. Irregular to some very regular, shaly to some papery parting; very irregular hackly fracture; breaks up on splitting. Some very irregular fractures with silty-textured pyrite. Very rare very fine crystalline streaks.
2874.4	2875.8	Oil shale: dark brownish gray to black (10YR 3/2-1/2). Faint smooth streaked bedding. Irregular medium to thin shaly parting; very irregular hackly fracture. Some irregular fractures with silty-textured pyrite. Rare black fossil fragments in lower part.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

## Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of oil shale and pyrite scraped from fractures from 2873.0 to 2875.8 feet: X-ray - pyrite, quartz, illite, dolomite, feldspar, ferroan.
2875.8	2876.8	Oil shale: black to very dark brownish gray (10YR 1/2-2/2). Very faint smooth bedding. Irregular to fairly regular, thin to medium shaly parting; irregular hackly fracture. Some fine silty-textured pyrite streaks, blebs, and irregular fracture fillings. Rare very fine crystalline blebs and streaks.
2876.8	2877.8	Oil shale: dark brownish gray and rare black (10YR 3/2-2/2, rare 1/2). Faint smooth streaked bedding. Irregular to some regular, thick to some thin parting; very irregular coarse to slight hackly fracture. Some very fine dense silty-textured crystalline streaks and blebs. Sample of oil shale with fine crystalline streaks and blebs from 2877.2 feet: X-ray - quartz, illite, dolomite, feldspar, ferroan.
2877.8	2880.8	Oil shale: very dark brownish gray to rare black (10YR 2/2, some 3/2, rare 2/2). Very faint smooth to rare slightly distorted bedding. Irregular shaly to rare papery parting; very irregular hackly fracture; commonly breaks up very badly on splitting. Rare very fine crystalline streaks and blebs. A thin gray-buff to gray pyritic band with short vertical fractures with white silky fillings at 2880.1 feet.
		Sample of gray band with very fine silky fracture fillings from 2880.1 feet: X-ray - pyrite, analcite, ferroan.
2880.8	2881.8	Oil shale: very dark brownish gray to black (10YR 2/2-1/2). Very faint smooth bedding. Irregular to some regular, thick to thin parting; irregular coarse hackly fracture. Rare very fine crystalline streaks and blebs.
2881.8	2882.9	Oil shale: medium to dark brownish gray (10YR 4/2-3/2, some 2/2 lower part). Faint smooth to slightly distorted streaked bedding. Slightly irregular to irregular, medium to thick parting; irregular coarse hackly fracture. Some very fine crystalline streaks and blebs (some in middle part are very pyritic).
2882.9	2883.9	Oil shale: black to very dark brownish gray (10YR 1/2-2/2). Very faint smooth bedding.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Slightly irregular thick to rare thin parting; irregular hackly fracture. Rare fine black dense to silty streaks and blebs.
2883.9	2885.2	Oil shale: dark and rare medium brownish gray (10YR 3/2-2/2, rare 4/2 upper part). Very faint smooth bedding. Irregular shaly to some papery parting; very irregular hackly fracture; breaks up very badly on splitting. Some very fine crystalline streaks near top.
2885.2	2886.5	Oil shale: very dark brownish gray and some black (10YR 2/2, some 1/2). Very faint smooth bedding. Irregular thin to medium shaly parting; irregular hackly fracture; breaks up on splitting.
2886.5	2887.5	Oil shale: dark to some medium brownish gray (10YR 3/2, some 2/2 upper part, some 4/2 lower part). Faint smooth to slightly distorted streaked bedding. Common very fine dense to silty-textured crystalline streaks and blebs. A short tight vertical fracture with resinous to vitreous black-organic coatings near base.
2887.5	2888.8	Oil shale: dark brownish gray (10YR 2/2-3/2). Very faint smooth bedding. Irregular shaly to papery parting; irregular hackly fracture; breaks up very badly on splitting. Rare very fine irregular pyritic silty stringers or fracture fillings in upper part.
2888.8	2890.4	Oil shale: dark brownish gray (10YR 3/2, some 2/2). Faint very slightly distorted to smooth streaked bedding. Irregular to fairly regular, thick to medium parting; irregular hackly fracture. Common fine crystalline streaks and stringers in upper part.
		[ Sample of shale with common fine crystalline streaks and stringers from 2888.9 feet: X-ray - quartz, ferroan, analcite, dolomite, pyrite, feldspar, illite.
2890.4	2898.0	Oil shale: dark brownish gray and very rare black (10YR 3/2, some 2/2, rare 1/2 middle part). Very faint smooth bedding. Irregular shaly to papery parting; hackly fracture; breaks up very badly on splitting. A 1-inch dense to silty-textured gray pyritic stringer at 2894.2 feet with very common fine intricately contorted gray to yellowish gray stringers extending 1 to 2 inches into shale below. Rare hard dense dark brownish gray bands in lower part.

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Laramie Petroleum Research Center, Laramie, Wyoming

April 6, 1967

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2898.0	2899.0	Oil shale: dark brownish gray (10YR 3/2-2/2). Very faint smooth bedding. Irregular papery to shaly parting; hackly fracture; breaks up very badly on splitting. Rare very irregular fractures with silty-textured pyrite fillings. A thin dense dark brown dolomite stringer at 2898.5 feet; rare fine dense streaks and blebs in other parts.
2899.0	2900.0	Oil shale: dark brownish gray (10YR & 7.5 YR 3/2-2/2). Faint smooth to some distorted streaked bedding. Irregular thick to thin shaly and some papery parting; irregular hackly fracture. Rare fine brownish gray to gray, dense to silty-textured streaks and stringers. Very rare fine silty-textured pyrite streaks.
2900.0	2901.4	Oil shale: dark brownish gray (10YR & 7.5YR 3/2-2/2). Faint smooth to some distorted laminae and streaked bedding. Irregular thick to papery parting; hackly to irregular and conchoidal fracture. Thin to thick dense bands alternating with papery shale. A 2-inch irregular hard gray silty band at 2900.3 feet. A 1/2-inch dense gray band at 2900.8 feet. [ Sample of hard gray silty band from 2900.3 feet: X-ray - quartz, ferroan, pyrite, feldspar, illite.
2901.4	2903.8	Oil shale: dark brownish gray (10YR 3/2-2/2). Very faint smooth to some distorted bedding. Irregular shaly to papery parting; very irregular hackly fracture; breaks up very badly on splitting. Rare very fine silty-textured pyrite streaks and irregular fracture fillings. Rare thick dense dark brownish gray dolomite bands. A 3/4-inch dense to silty-textured, buff to gray stringer at 2902.0 feet with common fine short stringers extending into shale below. [ Sample of hard dense dark brownish gray band from 2903.4 feet: X-ray - dolomite, trace quartz.
2903.8	2905.3	Oil shale: very dark brownish gray to rare black (10YR 2/2, rare 3/2 & 1/2). Very faint smooth streaked bedding. Irregular shaly to papery parting; irregular hackly fracture; breaks up on splitting. [ Very rare fine black fossil (?) fragments. Sample of papery shale from 2904.5 feet: X-ray - quartz, illite, ferroan, feldspar, dolomite, pyrite.
2905.3	2905.6	Dolomitic limestone (?): light to medium brownish gray (10YR 6/2-4/2). Faintly bedded to massive;

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		dense to fine granular texture (oolitic?). A thin band of very dark brownish gray shale in middle. Some very fine vertical fractures with patchy white silky fillings.
		Sample of oolitic dolomite (?) from 2905.5 feet:
		X-ray - dolomite, trace quartz.
2905.6	2905.9	Oil shale: very dark brownish gray (10YR 2/2). Very faint smooth bedding. Irregular thin shaly parting; hackly fracture.
2905.9	2906.4	Dolomite: dark to medium brownish gray (10YR 3/2 & 3/1-4/1). Dense, massive to very faintly bedded. Irregular thick parting; conchoidal fracture. A short smooth vertical fracture with very slight resinous coatings in lower part.
2906.4	2908.7	Oil shale: dark brownish gray (10YR 2/2-3/2 & 3/1). Very faint smooth bedding. Irregular to some very regular, thin to thick parting; irregular coarse to slight hackly fracture; breaks up on splitting. Common natural (?) vertical fractures. <u>Very common ostracods</u> (?) on parting surfaces in lower part.
		Sample of dark brownish gray shale with very common ostracods (?) from 2908.3 feet:
		X-ray - quartz, illite, pyrite; some feldspar, dolomite.
2908.7	2908.9	Dolomite: gray-buff to medium brownish gray (10YR 7/2-4/2). Massive, very oolitic.
2908.9	2909.2	Oil shale: dark brownish gray (10YR 3/1-2/2). Very faint smooth bedding. Irregular thin shaly to papery parting; hackly fracture. Some ostracods (?) and rare fish scales.
2909.2	2909.6	Siltstone (?) and dolomite: hard tight massive gray (N 4) siltstone with very common very fine disseminated pyrite in upper part; medium to dark brownish gray (10YR 4/2 & 4/1-3/1) oolitic dolomite in lower part. Common contorted oil shale stringers in middle; some fine oil shale streaks in lower part.
		Sample of hard gray pyritic siltstone from 2909.3 feet:
		X-ray - analcite, pyrite, feldspar.
2909.6	2910.6	Oil shale: dark brownish gray (10YR 2/2-3/2). Faint smooth bedding. Irregular thin to some thick shaly parting; irregular hackly fracture. Some ostracods and rare fish scales. A 1-inch dark brownish gray to gray blebby dolomite band at 2910.1 feet. A very thin pale yellowish buff

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		stringer at 2910.4 feet with common fine vermiform dense to silty-textured crystalline stringers extending into shale below.
		Sample of yellowish buff stringer with common very fine platy crystals from 2910.4 feet: X-ray - mixed layer clay, kaolin, feldspar.
2910.6	2911.5	Oil shale: dark brownish gray (10YR 3/2). Faint smooth streaked bedding. Slightly irregular to regular, medium to thick parting; slightly irregular and conchoidal fracture. Rare very fine dense to silty-textured crystalline streaks. Some ostracods and <u>very rare fish scales</u> . Some natural (??) vertical fractures. Irregular mixed up core pieces in middle part; true length doubtful.
2911.5	2912.5	Oil shale: dark brownish gray (10YR 2/2-3/2). Faint smooth to slightly distorted streaked bedding. Very regular to some irregular, thick to thin shaly and some papery parting; irregular fine to rare coarse hackly fracture. <u>Very</u> common ostracods. Some fine to 1-inch, dark to medium brownish gray ostracodal limestone stringers in lower part.
2912.5	2913.5	Dolomite and some shale: gray-buff and buff to light brownish gray dolomite (10YR & 2.5Y 7/1 & 7/2-6/1) and dark gray silty shale (N 3-2). Fairly dense dolomite with very faint irregular bedding and some interbedded shale. Irregular mixed up core pieces. Some natural vertical fractures with patchy soft tarry crusts. True length doubtful. Sample of dolomite from 2912.8 feet: X-ray - dolomite, quartz, trace feldspar.
2913.5	2916.0	Silty shale and siltstone: medium to dark gray and brownish gray shale (N 4-2 and 10YR & 2.5Y 5/2-2/2) and medium to light gray siltstone (N 5-7; common slight brown tint). Distinct interbedded smooth to distorted laminae, streaks, and stringers; some thin to 2-inch siltstone bands. Irregular to rare regular, thick to some thin parting; coarse hackly to irregular fracture. Some thin dolomite (?) stringers in upper part; some silty limestone stringers in lower part. Sample of light gray siltstone from 2914.5 feet: X-ray - quartz, feldspar, dolomite, calcite, illite, pyrite.
2916.0	2917.0	Oil shale (?): dark to medium brownish gray (2.5Y 4/1-3/1, some 5/1; commonly almost neutral gray); silty. Faint to some moderately distinct,

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		smooth to slightly distorted laminae and streaks. Irregular thin to thick shaly parting; irregular hackly fracture. Common fine light brownish gray dense to silty dolomitic streaks, stringers and rare thin bands.
2917.0	2918.0	Oil shale: dark to medium brownish gray (2.5Y 3/2 & 3/1-4/2 & 4/1; some almost neutral). Very faint smooth bedding and some very fine laminae. Irregular to rare regular, thick to thin parting; irregular to hackly fracture. Some dense brownish gray to brown laminae and thin bands in upper part.
2918.0	2919.0	Oil shale: dark to medium brownish gray (2.5Y 3/2 & 3/1-4/2 & 4/1). Faint smooth laminae and streaked bedding. Irregular to fairly regular, thick to thin parting; irregular to hackly fracture. Some very fine dense medium to light brownish gray streaks, laminae, and rare thick stringers.
2919.0	2920.0	Oil shale: dark to rare medium brownish gray (2.5Y & 10YR 3/2, rare 4/2). Very faint smooth bedding. Irregular to regular, thin to medium shaly parting; hackly fracture. A 2-inch dense buff limestone (?) band with some short tight vertical fractures and rare very fine oil-shale stringers at 2919.2 feet; a 1-1/2-inch dense medium brown band with tight vertical fractures at base.
2920.0	2921.4	Oil shale: dark brownish gray (10YR & 2.5Y 3/2, some 2/2). Very faint smooth bedding. Regular to irregular, shaly to papery parting; irregular hackly fracture; some parts break up very badly on splitting. Some thin to 1-1/4-inch dense medium to dark brownish gray bands. A 1-3/4-inch medium to light brownish gray oolitic band at 2920.9 feet. Some short tight vertical fractures with dark brown tarry fillings in dense bands.
2921.4	2922.5	Oil shale: dark brownish gray (10YR 3/2-2/2). Very faint smooth bedding. Regular to irregular, thick to thin shaly parting; irregular hackly fracture. Some fine dense medium brownish gray streaks and laminae in upper 0.2 foot; a 2-inch dense dark brownish gray band with a tar-filled vertical fracture at 2921.9 feet; a 2-3/4 inch dense medium brownish gray band with common fine tarry streaks and stringers at base. Rare <u>fine black fossil fragments</u> .

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of very dark brownish gray oil shale from 2922.2 feet: X-ray - quartz, illite, feldspar, pyrite.
2922.5	2923.7	Oil shale: dark brownish gray (10YR & 2/5Y 3/2-2/2). Very faint smooth bedding. Regular to irregular, thin shaly to some papery parting; hackly fracture; breaks up on splitting. Very rare fine brown lenses.
2923.7	2925.0	Oil shale: dark to rare medium brownish gray (10YR & 2.5Y 3/2-3/1, rare 4/1). Faint smooth bedding and some very fine laminae. Fairly regular to irregular, thick to some thin parting; slight fine to coarse irregular hackly fracture. Some fine dense to silty streaks and laminae. Very common very fine ostracods (?) in upper part.
		Sample of shale with some fine dense to silty laminae and streaks from 2924.6 feet: X-ray - quartz, illite, feldspar, dolomite, pyrite.
2925.0	2927.0	Oil shale: dark to some medium brownish gray (2.5Y & 10YR 3/2 & 3/1, some 4/1). Faint to rare moderately distinct smooth laminae and streaks. Fairly regular to irregular, thick to thin parting; irregular hackly fracture. Common fine to thin, dense to silty, brownish gray to gray laminae and streaks. A 2-inch medium to light brownish gray oolitic dolomite band at 2926.4 feet. Very rare dark brown to black fossil fragments.
2927.0	2928.0	Oil shale: very dark brownish gray (10YR 2/2, rare 3/2-3/1). Very faint smooth bedding. Irregular thin shaly to papery parting; hackly fracture; breaks up very badly on splitting. A 3-1/2-inch dense faintly bedded medium to dark brownish gray band with a tight vertical bitumen-filled fracture at 2927.6 feet; very irregular unconformable contact at base.
2928.0	2929.6	Shale: medium to dark brownish gray (10YR 4/1 & 4/2-3/1 & 3/2), silty. Faint smooth bedding and some laminae. Slightly irregular to irregular, thick to thin parting; very irregular slight to coarse hackly fracture.
2929.6	2930.6	Oil shale: dark to some medium brownish gray (10YR 3/2, some 4/2). Very faint smooth bedding. Irregular shaly to papery parting; irregular hackly fracture; breaks up on splitting. Some fine silty streaks. A 1-1/2-inch dense brownish

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		gray band with a tight vertical fracture with brownish black resinous coatings near top. Rare fine silty-textured pyrite streaks. Rare very fine black fossil (?) fragments.
2930.6	2931.4	Dolomite and oil shale: medium brownish gray dolomite (10YR 4/2-4/1). Hard dense very faintly bedded to massive dolomite at top and bottom. Oil shale as above from 2930.8 to 2931.1 feet. [ Sample of dolomite from 2931.3 feet: X-ray - dolomite, some quartz.
2931.4	2933.6	Oil shale (?) and shale: dark to medium brownish gray (10YR 3/2 & 3/1-4/2 & 4/1; some almost neutral in upper part). Faint smooth to slightly distorted streaked bedding. Irregular medium to thin shaly and rare papery parting; very irregular hackly fracture; breaks up very badly on splitting. Some fine dense to silty streaks and laminae. Rare 1-inch bands of hard dense brownish gray dolomite.
2933.6	2934.9	Shale: medium to dark brownish gray (10YR & 2.5Y 4/1-3/1, some 5/1; some almost neutral). Faint fairly smooth to distorted streaked bedding. Fairly regular to irregular, thick to thin parting; irregular and some hackly fracture. Common dense to silty brownish gray to gray streaks, laminae, and rare bands. A 1-1/2-inch white to very light yellowish buff band at top (like 2910.4 feet).
2934.9	2936.8	Shale: medium to dark brownish gray (2.5Y & 10YR 5/1-3/1). Faint smooth to slightly distorted streaked bedding and some laminae. Irregular to some fairly regular, thick to medium parting; irregular to coarse hackly fracture. Very common dense to silty, medium to light brownish gray and gray streaks, laminae, and rare bands. [ Sample of shale with common silty laminae and streaks from 2935.8 feet: X-ray - quartz, illite, feldspar, dolomite, pyrite.
2936.8	2937.7	Siltstone, marlstone (?), and rare oil shale: light gray to brownish gray siltstone (N 7 to 2.5Y 6/1) and buff to light brownish gray marlstone (2.5Y 7/2-6/2). Contorted stringers of siltstone, marlstone, and rare medium to dark brownish gray oil shale in upper 0.3 foot; massive gray siltstone at 2937.1-2937.5 feet; a thin zone of medium to dark brownish gray shale with common silty streaks

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		at 2937.5 feet; faintly bedded marlstone with some gray silty streaks in lower 0.2 foot. A vertical fracture with patchy crystalline dolomite (?) crusts and buff to white earthy to fibrous spots extends through most of interval.
2937.7	2938.4	Shale and siltstone: medium to dark brownish gray shale (2.5Y & 10YR 5/2 & 5/1-3/2 & 3/1) and light brownish gray to gray-buff siltstone (2.5Y 6/1-8/1; commonly almost neutral). Distinct interbedded fairly regular to distorted laminae, streaks, and stringers. Slightly irregular to irregular, thick to some thin parting; slightly irregular and conchoidal fracture.
2938.4	2939.5	Siltstone: very light gray (N 7-8; slightly buff), massive. Slightly irregular parting and fracture.
		[ Sample of siltstone from 2939.0 feet: X-ray - quartz, dolomite, feldspar.
2939.5	2941.1	Siltstone and shale: very light gray and gray-buff to light brownish gray siltstone (N 8-7 and 2.5Y 7/1-6/1) and medium to dark brownish gray shale (2.5Y 5/1 & 5/2-3/1 & 3/2). Distinct to faint slightly distorted interbedded laminae and streaks; predominantly siltstone in upper part to shale with very common silty streaks and laminae in lower part. Slightly irregular to irregular, thick to rare medium and thin parting; irregular fracture. A 3-inch band of faintly bedded hard buff marlstone (?) with some fine to thin gray silty streaks at 2940.4 feet.
		[ Sample of hard buff marlstone from 2940.4 feet: X-ray - dolomite; some quartz, feldspar.
2941.1	2943.0	Shale: medium to dark brownish gray (2.5Y 5/1-3/1 & 3/2). Very faint fairly smooth bedding. Irregular thick to thin parting; irregular fracture; breaks up on splitting. Common silty streaks in upper part. A 3/4-inch dense brownish gray band with tight vertical fractures near base.
2943.0	2945.1	Oil shale (?): dark brownish gray (2.5Y 3/1-3/2, some 2/2 lower part). Very faint smooth to slightly distorted bedding. Irregular shaly to papery parting; very irregular hackly fracture; breaks up very badly on splitting. Some thick hard dense medium to dark brownish gray bands.

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		A very thin pale yellowish buff stringer with common fine dark gray stringers (fracture fillings?) at 2943.9 feet; finely brecciated shale with yellowish gray to light gray fracture fillings immediately below.
2945.1	2946.3	Oil shale: very dark brownish gray to some black (2.5Y 2/2 & 2/1, some 3/2-3/1 & 1/2). Very faint smooth bedding. Irregular to very smooth, papery to shaly parting; hackly fracture; breaks up very badly on splitting; 1-inch dense brownish gray bands at 2945.8 and 2946.0 feet. Rare very fine silty-textured pyrite streaks.
2946.3	2948.5	Oil shale: dark brownish gray (2.5Y 3/2-2/2). Very faint smooth streaked bedding. Irregular to very smooth, thin to thick shaly parting; coarse to slight hackly fracture. A 2-inch faintly bedded dense buff to light brownish gray marlstone (?) band at top; two very thin bands immediately below. A 1-inch hard dense dark brownish gray band 2946.7 feet.
2948.5	2949.6	Oil shale: dark brownish gray (2.5Y 3/2-2/2). Very faint smooth streaked bedding. Regular to irregular, shaly to papery parting; irregular hackly fracture; breaks up very badly on splitting. Very common ostracods (?) on parting surfaces.
2949.6	2951.5	Mudstone (?), oil shale, and marlstone: faintly bedded gray shaly mudstone in upper 0.3 foot (N 4-5); very faintly bedded to massive brownish gray silty mudstone at 2950.2-2950.5 feet (2.5Y 4/1-5/1; almost neutral); three 1- to 2-inch dense medium to light brownish gray marlstone bands in lower 0.6 foot (10YR 5/2-6/2). Oil shale as above in other parts.
2951.5	2954.2	Shale: dark to medium brownish gray (2.5Y 3/1 & 3/2-4/1; commonly almost neutral). Faint smooth to slightly distorted streaked bedding. Irregular shaly and rare papery parting; very irregular hackly fracture; breaks up very badly on splitting. Some dense brownish gray to gray streaks, laminae, and thin bands; thick hard dense bands at 2952.9-2953.2 and 2953.9-2954.2 feet. Rare fossil fragments (some fish scales).
2954.2	2956.5	Oil shale: dark brownish gray to rare black (2.5Y 3/2 & 3/1-2/2, rare 1/2 lower part). Very faint slightly distorted to smooth bedding. Irregular shaly to papery parting; hackly fracture; breaks up very badly on splitting.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2956.5	2957.5	Oil shale and marlstone: dark brownish gray oil shale (2.5Y 3/2-2/2). Very faint smooth bedding. Irregular shaly to papery parting; hackly fracture. Dense medium brownish gray to buff marlstone bands at 2956.5-2956.7, 2957.1-2957.2 and 2957.3-2957.5 feet.
2957.5	2964.0	Shale: dark to medium brownish gray (2.5Y 3/1-4/1; commonly almost neutral). Very faint smooth bedding. Irregular shaly to papery parting; hackly fracture; breaks up very badly on splitting. A 2-inch hard dense brownish gray (almost neutral) band at 2960.5 feet.
2964.0	2965.5	Shale: dark brownish gray (2.5Y 3/1 & 3/2, some 2/2 lower part). Very faint smooth bedding. Irregular shaly to papery parting; hackly fracture; breaks up on splitting. A very thin dense to blebby gray pyritic band at 2964.4 feet; rare fine streaks in other parts. A 3-inch dense brownish gray band with some irregular oil-stained fractures and very fine cavities at base.
2965.5	2966.3	Oil shale: dark brownish gray (2.5Y 3/1 & 3/2-2/2). Very faint smooth bedding. Irregular shaly to papery parting; hackly fracture; breaks up on splitting.
2966.3	2975.0	Shale: dark brownish gray (2.5Y 3/1 & 3/2-2/2, rare 10YR 3/2-2/2). Very faint smooth bedding. Irregular to very regular, shaly to papery parting; hackly fracture; breaks up very badly on splitting. Some fine laminae to 6-inch bands of dense brownish gray marlstone. Very rare fish scales in lower part. A 1-3/4-inch dark gray to brownish gray oolitic dolomite band at 2974.6 feet.
2973.5	2974.0	Missing.
2975.0	2976.0	Oil shale: very dark brownish gray to rare black (2.5Y & 10YR 2/2, rare 1/2 lower part). Very faint smooth bedding. Regular to irregular, papery to shaly parting; hackly fracture; breaks up on splitting.
		<div style="border-left: 1px solid black; padding-left: 10px; margin-left: 20px;"> Sample of very dark brownish gray to black oil shale from 2975.8 feet:  X-ray - quartz, illite; some dolomite, feldspar, pyrite. </div>
2976.0	2977.4	Oil shale: dark brownish gray (2.5Y & 10YR 2/2-3/2 & 3/1). Very faint smooth bedding. Regular to irregular, papery to shaly parting; hackly fracture; breaks up very badly on splitting. Some 1/2- to 3-inch dense medium brownish gray faintly bedded to laminated marlstone bands.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Sample of dense faintly bedded to laminated marlstone from 2976.8 feet: X-ray - dolomite, some quartz.
2977.4	2978.9	Shale: dark to medium brownish gray 2.5Y 3/1-4/1). Faint smooth bedding. Irregular papyry to shaly parting; hackly fracture; breaks up very badly on splitting. Some dense dolomite bands with tight irregular high angle <u>tar-coated fractures</u> . Common fine dense streaks and laminae in lower part. A 3-inch band of medium to light gray hard siliceous marlstone (?) at 2978.2 feet.
2978.9	2982.0	Siltstone and shale: gray-buff to dark brownish gray (2.5Y 7/1-3/1 & 3/2). Distinct to faint interbedded smooth to slightly distorted laminae and streaks. Fairly regular to irregular, thick to medium and rare thin parting; slightly irregular to irregular fracture. A 2-inch dense light brownish gray dolomite band at top; rare thin bands and laminae in other parts.
		Sample of interbedded shale and siltstone from 2979.5 feet: X-ray - quartz, illite, feldspar, dolomite.
2982.0	2983.0	Oil shale: medium to dark brownish gray (10YR & 2.5Y 4/2-3/2, some 4/1-3/1 upper part). Faint smooth streaked bedding and very fine laminae. Regular to irregular, thin to some thick parting; slight to irregular coarse hackly fracture; breaks up on splitting. A thin irregular dense blebby dolomite band at 2982.6 feet.
2983.0	2985.2	Mudstone: gray-buff to light and rare medium gray (2.5Y 7/1 and N 7-6, rare 5). Very faint very fine smooth laminae to very slightly distorted streaked bedding. Regular to irregular, thick to rare medium parting; regular to slightly irregular and conchoidal fracture.
		Sample of very faintly laminated mudstone from 2983.4 feet: X-ray - quartz, illite, feldspar, dolomite.
2985.2	2986.2	Shale: medium to dark brownish gray (10YR 4/2 & 4/1-3/2, rare 5/2). Faint smooth laminae. Irregular to some regular, thick to thin parting; irregular to hackly fracture. Common gray-buff to light brownish gray, silty to dense laminae and streaks.
2986.2	2987.3	Shale: dark to medium brownish gray (10YR & 2.5Y 3/2-4/2 & 4/1). Faint smooth laminae and streaked bedding. Irregular thick to thin shaly and rare

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core Samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
2987.3	2991.5	<p>papery parting; irregular slight to coarse hackly fracture; breaks up on splitting.</p> <p>Shale: medium to dark brownish gray (2.5Y 5/1-3/1). Faint smooth to slightly distorted laminae and streaked bedding. Irregular thick to thin parting; irregular hackly fracture; breaks up on splitting. Common very thin to 1-inch, gray to brownish gray, silty to dense bands.</p>
2991.5	2993.4	<p>Shale: medium to dark brownish gray (2.5Y &amp; 10YR 4/1-3/1, some 4/2-3/2). Faint smooth to very slightly distorted streaked bedding. Irregular thick to thin shaly parting; irregular hackly fracture; breaks up on splitting. Some dense to silty, brownish gray to gray laminae and streaks in upper part; a 2-inch faintly laminated dense brownish gray band with a tar-stained vertical fracture at base.</p>
2993.4	2995.5	<p>Shale: dark to some medium brownish gray (2.5Y &amp; 10YR 3/2-3/1, some 4/1, rare 2/2). Very faint smooth bedding. Irregular papery to shaly parting; hackly fracture; breaks up very badly on splitting. Rare thin to 1-inch, medium to light brownish gray and gray, dense to very fine blebby bands. Common fine dense to silty buff streaks and laminae in lower 0.5 foot.</p>
2995.5	2999.9	<p>Siltstone and very fine sandstone: gray-buff to buff-white (10YR 7/1-9/1; almost neutral gray to white), calcareous, <u>oolitic</u>. Very faint smooth bedding to some massive. Slightly irregular thick parting; fairly regular fracture. An irregular vertical fracture with earthy yellowish buff coatings and some calcite crusts from 2995.9 to 2996.6 feet. Some very fine shale streaks and stringers near top. Sharp irregular contact with shale below.</p>
2999.9	3002.0	<p>Shale: medium to dark brownish gray (10YR &amp; 2.5Y 4/2 &amp; 4/1-3/2 &amp; 3/1, rare 2/2). Faint slightly distorted streaked bedding in upper part to fairly distinct smooth laminae and streaks in lower part. Irregular to very regular, thick to thin parting; irregular and coarse hackly to fairly regular fracture. Some fine light gray silty streaks and blebs in upper part. Some fine vermiform oolitic stringers at top. Common fine brownish gray to buff, dense to silty laminae</p>

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		and streaks in lower part. Sharp smooth conformable contact with sandstone below.
3002.0	3024.9	Sandstone, fine grained: white to very light gray (N 9-8; commonly slightly buff), calcareous, oolitic. Very faint smooth to distorted bedding and some massive. Occasional very fine shale streaks and stringers. Sharp irregular contact with shale below.
3024.9	3027.2	Siltstone and shale: gray-buff to medium and some dark brownish gray (10YR & 2.5Y 8/1-4/1 & 4/2, some 3/1-3/2). Fairly distinct finely distorted interbedded streaks, stringers, and laminae; some thin to 2-inch siltstone bands. Irregular to some fairly regular, thick to rare thin parting; irregular fracture. A 1-inch dense brownish gray band at 3025.3 feet; tightly fractured to brecciated with some oolites in matrix. A very fine tight bitumen-filled vertical fracture in siltstone in lower 2 inches.
3027.2	3028.4	Oil shale (?): medium to dark brownish gray (10YR & 2.5Y 4/2 & 4/1-3/2). Faint slightly distorted to smooth streaked bedding and some laminae. Slightly irregular to irregular thick to rare thin parting; slightly irregular, to irregular hackly fracture. Common fine brownish gray to gray-buff silty streaks and stringers.
3028.4	3029.9	Shale: medium brownish gray (2.5Y & 10YR 4/2-4/1). Faint slightly distorted to smooth streaked bedding. Irregular thick to some thin parting; slightly irregular to very irregular and rare coarse hackly fracture. Some fine gray-buff silty streaks and stringers.
3029.9	3030.9	Oil shale (?): medium to dark brownish gray (10YR & 2.5Y 4/2 & 4/1-3/2). Faint slightly distorted to smooth streaked bedding. Slightly irregular to very irregular, thick to rare thin parting; irregular fracture. Some fine brownish gray silty to dense streaks and laminae in upper part. Rare ostracods.
		Sample of dark to medium brownish gray oil shale from 3030.8 feet: X-ray - quartz, illite, dolomite, feldspar, pyrite.
3030.9	3033.7	Shale: medium to dark brownish gray and olive gray (2.5Y & 5Y 4/1-3/1 & 3/2; some almost neutral). Faint smooth to some distorted laminae and streaked bedding. Irregular thick to thin parting; very irregular hackly fracture; breaks up on splitting. A 4-inch dense light brownish gray dolomite band with common oolitic stringers and patches at top. Some very irregular brownish

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## LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		gray silty to sandy injected stringers with rare oolites in upper part. Common thin to 2-inch dense faintly bedded medium to light brownish gray bands in lower part.
		Sample of injected stringer from 3031.7 feet: X-ray - quartz, dolomite, feldspar, illite, pyrite.
3033.7	3034.0	Missing.
3034.0	3037.0	Shale: dark to medium brownish gray and olive gray (2.5Y & 5Y 3/1-4/1). Very faint smooth bedding and some laminae. Irregular to regular, shaly to papery parting; hackly fracture; breaks up very badly on splitting. A 1-inch dense brownish gray band with a tar-coated vertical fracture near top.
3037.0	3039.0	Shale: as above. Some thin dense brownish gray bands in upper part. Dense medium to light brownish gray dolomite with some oolites at 3037.6-3038.1 feet; a thin shale parting at 3037.7 feet; tightly fractured to brecciated in lower 0.2 foot. Some very irregular light brownish gray to gray, silty to sandy pyritic injected stringers with rare oolites in lower part. Some dirty oily stains on outside of core in dolomite section. Sample of dolomite from 3037.8 feet: X-ray - dolomite, some quartz.
3039.0	3041.9	Shale: dark olive gray and brownish gray (5Y & 2.5Y 3/1-2/1). Very faint smooth bedding. Irregular to very regular, shaly to papery parting; hackly fracture; breaks up very badly on splitting. A 4-inch dense brownish gray dolomite band with a tight nearly vertical tar-stained fracture at 3040.3 feet; a thin dense oolitic dolomite band at 3041.7 feet.
3041.9	3043.6	Shale, siltstone, and silty dolomite: dark to medium gray and brownish gray (N 3-5 and 2.5Y 3/1-5/1, rare 5/2). Fairly distinct interbedded laminae and streaks of shale, siltstone, and rare dolomite; thick dolomite zones with fine silty streaks and laminae at 3042.8-3043.0 and 3043.2-3043.6 feet. Irregular to slightly irregular, thick to rare thin parting; slightly irregular fracture.
3043.6	3045.1	Shale and siltstone: medium to dark gray (N 5-2; very slight brown to olive tint in dark parts).

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Laramie Petroleum Research Center, Laramie, Wyoming

April 6, 1967

# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		Fairly distinct interbedded laminae and streaks. Slightly irregular to very regular, thick to medium parting; slightly irregular fracture. Sample of interbedded shale and siltstone from 3044.5 feet: X-ray - quartz, feldspar, dolomite, calcite, illite, pyrite.
3045.1	3048.0	Shale and some limestone (?): very dark brownish gray and olive gray shale (2.5Y & 5Y 2/1, some 3/1; commonly almost neutral). Very faint smooth bedding. Irregular medium to thin shaly parting; very irregular hackly fracture; breaks up on splitting. Thick zones of brownish gray ostracodal limestone with interbedded shale at 3045.5-3046.0 and 3047.3-3047.8 feet; some thin bands at 3046.7-3046.8 feet. Some fine gray siltstone laminae and streaks. Very rare small tan earthy blebs in middle part.
3048.0	3052.0	Shale and siltstone: dark to medium gray (N 2-5; common very slight olive tint in darker parts). Dark shale with very common interbedded laminae and streaks of gray calcareous siltstone. Fairly regular to irregular, thick to thin shaly parting; slightly irregular to coarse hackly fracture; commonly breaks up on splitting.
3052.0	3054.0	Shale: dark gray (N 3-1; common slight olive to brown tint). Very faint smooth bedding and some laminae. Very regular to irregular, medium to thin shaly parting; irregular hackly fracture; breaks up on splitting. Some very fine gray silty laminae and streaks.
3054.0	3054.9	Limestone (?): buff to rare medium brownish gray (2.5Y & 10YR 7/2-6/2 & 6/1, rare 5/1), oolitic, massive. Sharp slightly wavy contacts at top and bottom.
3054.9	3056.4	Shale: dark to some medium brownish gray (2.5Y 3/1-2/1, some 4/2; commonly almost neutral). Faint very slightly distorted to smooth laminae and streaked bedding. Irregular thick to thin shaly and some papery parting; irregular to hackly fracture; some parts break up very badly on splitting. Some fine brownish gray silty laminae.
3056.4	3060.8	Limestone: light buff to some light brownish gray (10YR 3/2-7/2, some 6/2, very oolitic, massive. Some very fine shale stringers near top. Some sparry calcite. Rare small irregular masses of dark oolites in milky gray quartz (?) in middle part.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
3060.0	3061.1	Shale and siltstone: dark to light brownish gray (2.5Y 3/1-6/1). Faint to some moderately distinct fairly smooth interbedded laminae and streaks. Irregular to fairly regular, thick to thin parting; coarse hackly to slightly irregular fracture.
3061.1	3062.8	Siltstone and some shale: medium to light gray calcareous siltstone (N 5-6) and medium to rare dark brownish gray shale (2.5Y 5/1-4/1, rare 3/1-3/2). Siltstone with common fine smooth to slightly distorted shale laminae and streaks. Irregular thick parting; slightly irregular fracture. A 3-inch band of buff to light brownish gray limestone at base.
3062.8	3063.9	Shale and siltstone: medium to dark brownish gray shale (2.5Y 5/1-3/1) and medium to light gray calcareous siltstone (N 5-6). Moderately distinct interbedded smooth to slightly distorted laminae and streaks. Fairly regular to irregular, thick to medium parting; slightly irregular fracture.
3063.9	3065.1	Siltstone, limestone, and some shale: medium to light gray calcareous siltstone and silty limestone (N 4-6) and some medium to rare dark brownish gray shale (2.5Y 5/1-4/1, rare 3/1; almost neutral). Siltstone with faint slightly distorted bedding to massive limestone; some interbedded shale laminae and streaks in middle part. Irregular parting and fracture.
3065.1	3066.6	Shale: medium to dark brownish gray (2.5Y 5/1-3/1 & 3/2). Faint smooth bedding; common fine fairly distinct medium to light gray silty laminae and streaks in upper half. Fairly regular to irregular, thick to thin parting; slightly irregular to irregular hackly fracture.
3066.6	3068.6	Shale and silty limestone: medium to dark brownish gray and olive gray shale (2.5Y & 5Y 5/1-3/1) and medium to rare light gray limestone (N 4-5, rare 6; common slight brown to olive tint). Faint interbedded laminae and streaks to some thick limestone bands. Irregular to some fairly regular, thick to some thin parting; irregular fracture. <div style="margin-left: 40px;">Sample of silty limestone (or calcareous siltstone) from 3067.7 feet:  X-ray - quartz, illite, calcite, feldspar, dolomite.</div>
3068.6	3071.2	Shale: dark and rare medium brownish gray (2.5Y 3/1-3/2, rare 4/1 upper part). Very faint smooth

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
3071.2	3072.2	streaked bedding. Irregular medium to thin shaly and rare papery parting; very irregular hackly fracture; breaks up very badly on splitting. Limestone: light to medium brownish gray (2.5Y 6/1-5/1), very oolitic. Massive; rare fine shale partings. Very irregular thick to thin parting; irregular fracture.
3072.2	3074.0	Shale: dark to medium brownish gray (2.5Y 3/1 & 3/2-4/1; some almost neutral). Very faint smooth streaked bedding. Irregular medium to thin shaly and rare papery parting; very irregular hackly fracture; breaks up very badly on splitting. Grayest parts are commonly silty.
3074.0	3075.5	Shale: medium to rare dark brownish gray (2.5Y 4/1, rare 3/1), calcareous. Very faint smooth bedding. Irregular to some regular, thick to thin parting; commonly breaks up on splitting. Rare clam shells.
3075.5	3080.0	Missing.
3080.0	3082.8	Shale, as above.
3082.8	3084.0	Limestone: medium brownish gray (10YR & 2.5Y 4/1-5/1). Dense to silty; common very fine contorted dark brownish gray shale streaks and stringers. Irregular parting and fracture.
3084.0	3091.0	Shale: medium to rare dark brownish gray (2.5Y 4/1, rare 3/1, very rare 3/2), calcareous. Very faint smooth streaked bedding. Irregular to some regular thick to some thin parting; slightly irregular and conchoidal to very irregular fracture; some parts break up on splitting. [ Sample of shale from 3087.3 feet: X-ray - quartz, illite, calcite, pyrite, feldspar, dolomite.
3091.0	3095.0	Shale: medium to dark brownish gray, (2.5Y 4/1-3/1), slightly calcareous. Very faint smooth bedding. Irregular medium to thin shaly and some papery parting; very irregular hackly fracture; breaks up very badly on splitting. [ Sample of papery shale from 3091.3 feet: X-ray - quartz, illite, pyrite, feldspar, kaolin.
3095.0	3097.3	Shale: medium to dark brownish gray (2.5Y 4/1-3/1). Very faint smooth bedding. Irregular thick to thin shaly and rare papery parting; irregular hackly fracture; commonly breaks up very badly on splitting. Rare fine dense to silty gray streaks and stringers.

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
3097.3	3098.3	Limestone and shale: medium to light brownish gray limestone (10YR & 2.5Y 5/1-6/1) and medium to dark brownish gray shale (2.5Y 4/1-3/1, rare 2/1). Dense limestone with common fine contorted shale stringers and streaks. Irregular parting and fracture. <div style="margin-left: 40px;">Sample of limestone with contorted shale stringers from 3097.7 feet:  X-ray - calcite, dolomite, quartz, illite, kaolin.</div>
3098.3	3102.1	Siltstone: very light to medium gray (N 8-5; common slight brown tint), very calcareous. Faintly mottled to massive. Irregular thick parting; irregular to fairly regular fracture. Some very distorted fine shale stringers and streaks.
3102.1	3103.5	Siltstone and very fine sandstone: light gray and some brownish gray (N 7-6, some 2.5Y 6/1), very calcareous. Common very distorted fine shale streaks and stringers. Irregular thick parting; slightly irregular fracture. A 2-inch zone of interbedded dark brownish gray to black silty shale and light gray siltstone at 3103.2 feet; a fine vitreous black brittle organic seam near middle.
3103.5	3106.2	Siltstone: light gray (N 7-6; common slight brown tint), calcareous. Common fine distorted to contorted shale stringers and streaks. Irregular parting and fracture.
3106.2	3109.3	Mudstone: light to medium gray (N 6-5, some 7 upper part; common slight olive to green tint). Massive to faintly mottled. Badly broken up and mixed up; true length doubtful. (Yielded no oil in test tube.) <div style="margin-left: 40px;">Sample of mudstone from 3106.7 feet:  X-ray - quartz, illite, feldspar, kaolin.</div>
3109.3	3116.6	Mudstone and siltstone: light gray (N 7-6, rare 8 lower part; common slight olive to blue-green tint), grading to very calcareous in lower part. Massive. Irregular thick parting; irregular to fairly regular fracture. Some very fine pyrite in lower part.
3116.6	3120.9	Fine sandstone and siltstone: very light gray (N 7-8), calcareous, massive. Slightly irregular thick parting; fairly regular fracture.
3120.9	3123.7	Mudstone: light to some medium and rare dark gray (N 7-6, some 5, rare 4-3 lower part; common slight olive to green tint), slightly calcareous,

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# LITHOLOGIC DESCRIPTION OF SAMPLES SUBMITTED FOR ASSAY

Core samples from BuMines-AEC Colorado Corehole No. 1--Continued

From	To	Description
		massive. Very irregular parting and fracture; lower part badly broken up and mixed up. Some fine pyrite in upper part. (Dark mudstone yielded no oil in test tube.)
3123.7	3125.4	Mudstone and siltstone: light gray (N 8-6; some very slight green tint), slightly calcareous, massive. Irregular parting and fracture. Some fine pyrite near top.
3125.4	3128.0	Mudstone: light to medium gray (N 6-5), slightly calcareous, massive. Very irregular parting and fracture; some parts badly broken up and mixed up. Common small irregular pyrite masses in lower part.
3128.0	3133.2	Mudstone, siltstone, and some very fine sandstone: very light to some medium gray (N8-7, some 6-5, rare 4), calcareous, massive. Irregular parting and fracture. Lower part badly broken up and mixed up.
3133.2		Bottom of recovered core.
3140.0		Bottom of hole.

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Laramie Petroleum Research Center, Laramie, Wyoming

April 6, 1967